

MEAT AND ITS
INSPECTION

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DEPARTMENT OF
PATHOLOGY AND
BACTERIOLOGY.

MEAT AND ITS INSPECTION

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A PRACTICAL GUIDE FOR MEAT
INSPECTORS, STUDENTS, AND MEDICAL
OFFICERS OF HEALTH

BY

ARTHUR R. LITTELJOHN

M.R.C.S., L.R.C.P., M.R.C.V.S., D.P.H.

FORMERLY TUTOR IN VETERINARY MEDICINE, ROYAL VETERINARY COLLEGE, LONDON;
ASSISTANT TO THE MEDICAL OFFICER OF HEALTH AT CROYDON BOROUGH FEVER
HOSPITAL; AND ASSISTANT BACTERIOLOGIST TO CROYDON BOROUGH

DEPARTMENT OF
PATHOLOGY AND
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BAILLIÈRE, TINDALL AND COX
8 HENRIETTA STREET, COVENT GARDEN

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PREFACE

MEAT INSPECTION is a subdivision of Public Health Work that, in this country is yearly becoming more thoroughly recognized to be one of increasing importance. It is owing to this appreciation of its importance that the present work is being brought before its readers in the hope that it will prove useful to those engaged in this branch of Public Health work, and will satisfy a long felt want.

Endeavour has been made to touch upon most of the conditions likely to be met in the slaughterhouse, and, as far as possible, the subject has been dealt with in simple terms, so that it may be more easily understood by those who have had no professional training in pathology. Long descriptions of bacteriological investigations have also been avoided. Those who wish to investigate this part of the subject more fully must refer to some of the larger books on bacteriology. It is hoped, however, that the remarks on bacteriology, which have of necessity to be included, will prove sufficient for the majority of those concerned with the inspection of meat. The work is not intended as a textbook on the subject, but rather as an aid to those who have to deal practically with the subject, such as Meat Inspectors, and students for the Public Health Diploma. For this reason the statutory powers concerning the Inspection of Meat have been included. A summary of those most commonly in use is for convenience placed in the introduction. Recognition is expressed for much valuable information obtained from the Handbook of Meat Inspec-

tion, by Ostertag; the Textbook of Meat Hygiene, by Edelmann; and the Handbook on Meat Inspection, by Walley. Most of the illustrations were drawn by the author, but the few that have been borrowed are acknowledged below the illustration.

A. R. L.

May, 1911.

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ABBREVIATIONS

- B.A. = Board of Agriculture.
- C.C. = County Council.
- L.A. = Local Authority.
- L.G.B. = Local Government Board.
- M.O.H. = Medical Officer of Health.
- P.H.A. = Public Health Act.
- S.A. = Sanitary Authority.
- V.S. = Veterinary Surgeon.

MEAT AND ITS INSPECTION

CHAPTER I

Introduction—Statutory powers—Slaughtering and dressing carcasses
—Inflation of carcase—Rigor mortis.

Introduction

THE inspection of meat efficiently carried out should insure the consumers against any great risk of contracting—
1. Any communicable infectious disease, such as tuberculosis, anthrax, etc. 2. Any communicable parasites, such as *Trichina spiralis*, tapeworm, etc. 3. Ptomaine-poisoning.

It should also protect the consumer from buying inferior meat at a price for which he has a right to expect meat of a superior quality. The mere examination of carcasses after the beasts have been slaughtered and the carcasses dressed is not in itself sufficient. To make the inspection of meat as efficient as possible, it is essential that the animals prior to slaughter be examined by some competent inspector—preferably a veterinary surgeon—the reason being that the meat of animals slaughtered whilst suffering from many febrile conditions will show no changes that warrant its seizure, yet the meat will be quite unfit for, and often dangerous as food for man. After calving, for example, a cow may develop septic metritis (suppuration of the womb, usually from a retained ‘after-birth’). The cow is sent to market to be sold to the butcher. If seen before slaughter, she will frequently be ‘unthrifty’ and obviously ill, with short jerky breathing, the tail and hind-quarters wet and soiled with a fœtid discharge, which is

dripping from the vulva. She probably will have a temperature of 104° to 105° F. If slaughtered, however, and the carcass dressed before inspection, the uterus will have been thrown away, and the carcass will frequently escape seizure, in spite of the 'fevered flesh.' Yet the meat of an animal such as this, has repeatedly been held responsible for outbreaks of poisoning and death (see Meat-Poisoning—Intoxication).

Apart from febrile conditions, one may see living animals obviously unfit for human food, the meat of which after slaughter and dressing of the carcass may be sufficiently presentable to pass an unsuspecting inspector. For example, old ewes that are no longer of any value for breeding purposes, and have developed signs of dropsy, are sent to market. When seen there, they are found to be hide-bound, scraggy-looking beasts, with pendulous bellies frequently containing fluid. At the time of slaughter the carcass is dripping wet and the flesh water-logged; but by means of 'blowing' and hanging the carcass much of the water escapes, and the carcass may thus avoid seizure.

Apart from the benefits to the consumer, inspection prior to slaughter has other advantages. To some extent it protects butchers and slaughtermen from the risk of contracting anthrax and other inoculable disease. It also enables the slaughtering of animals suffering from a transient complaint, to be postponed for a few days, thereby avoiding total seizure of the carcass, which might otherwise be ordered. Animals suffering from a febrile condition, exhaustion from travelling, or recent parturition, bleed badly and make inferior and often repulsive meat, which decomposes unusually rapidly (often six to twelve hours after slaughter). Again, it is often of benefit to postpone the slaughter of animals that have recently received bruises, or are suffering from recent hæmorrhages, septic wounds, or traumatic emphysema.

Animals that are dull and refuse their food as a result of exhaustion from travelling will usually be found to recover their normal condition, and be in a fit condition for

slaughter, in six to eight hours. In the case of animals nearly full-time pregnant, or just recently confined, it is usually advisable to postpone slaughter till about ten days after parturition, in order to obtain the carcass in its most marketable condition. Examination of the animal during life will also often enable the inspector to pass doubtful organs, whereas without the information thus obtained, the doubtful organs would necessarily be seized.

The most important part of an ante-mortem examination is the detection of infectious diseases, septic diseases, and intoxications, all of which render the meat unfit for human food, but frequently fail to produce in the carcass any marked change which can be recognized during a post-mortem inspection. The examination of the skin for tumours (abscesses, actinomycosis) or the larvæ of flies, etc., is more easily carried out before than after slaughter. As occasion requires, therefore, the animal may be condemned before slaughter, or the decision postponed till after the post-mortem examination.

It is advisable that the inspector be present at the commencement of slaughtering, so that neither fluid in the body cavities shall be overlooked, nor pathological lesions removed, nor healthy organs substituted for diseased organs. Careful washing by the butcher will remove lymph from the surface of the peritoneum in cases of peritonitis, and gentle scraping will render very difficult, if not impossible, the recognition of a fibrinous or plastic peritonitis. 'Stripping' the pleura in tuberculous pleuritis is often practised when temptation arises. This, however, can frequently be recognized by the ribs and intercostal muscles having a cloudy, rough, and opaque surface, instead of being smooth and glistening. A convenient test for this condition is to cast the light of a burning match on to the suspected chest wall, and note the dim and ill-defined reflection in the case of a stripped pleura. The part that most markedly shows this attempt at deception is the pleural surface of the diaphragm (skirt). Some of the lymphatic glands in the intercostal spaces and at the

entrance to the thorax will, on examination in such cases, show tuberculous changes.

Attention may also here be drawn to the practice of removing a pregnant uterus from the carcase, with intention to extract the fœtus for subsequent sale. It is for this reason, and with the desire to detect cases of septic metritis, that, in examining female carcasses, the uterus should always be sought. If the inspector cannot be present at the time of slaughter—and this is obviously impossible in all cases—the internal organs and skin, where possible, should be left attached to the carcase. The intestines must, of course, be removed, but the kidneys, spleen, liver, lungs, and udder, should remain. No scalding, etc., of the gut, hoofs, hide, etc., should be allowed until these parts have been inspected; and no organs should be removed from the slaughterhouse until permission has been granted by the inspector.

In Germany all organs and meat when inspected, and found to be sound, are stamped with indelible ink, to prevent their being replaced by diseased uninspected organs. Consumers need thus buy only inspected meat. Pickled and smoked meat is stamped with a firing iron. When condemned, the organs, etc., are removed to the sanitary slaughterhouse and disinfected under official supervision, unless suitable to be sold as 'Freibank meat,' in which case they are specially stamped as such, and sold under official supervision (Ostertag).

Freibanks.—The system of selling unmarketable meat at shops known as Freibanks, is in Germany, carried out under police supervision. All such meat is sold under declaration, and, being meat of an inferior quality or obtained from diseased animals, it is sold at a much reduced price. The meat from animals suffering from tuberculosis, swine fever, 'measles,' etc., which in this country would be condemned and destroyed, is in Germany first sterilized by boiling or steaming, and then sold at a Freibank. All customers buying meat from these premises are aware that it is inferior in quality and unsaleable in

the open market. By this means great loss is saved the producers, and the poorer classes are able to obtain nutritious meat, although of an inferior quality, at much-reduced prices.

Statutory Powers governing the Inspection of Meat.

It is a crime or misdemeanour to expose for sale, or to possess for the purpose of selling, any food that is unfit for the consumption of man. If death results, it is manslaughter. Each of our three countries has separate general statutes, as has also the London Metropolis. There are also numerous local Acts.

The work of the medical officer of health and his inspectors is supervised by the Local Government Board.

At the present time the only statutory powers in common use for seizing unwholesome meat are—(1) Public Health Act, 1875, Sections 116-119; (2) Public Health (Amendment) Act, 1890, Section 28; (3) Public Health (London) Act, 1891, Section 47; (4) Public Health (Foreign Meat) Regulations, 1908.

An endeavour will be made in subsequent pages to include all the Acts and Regulations concerned with the subject of meat inspection. A brief résumé only, of the working sections of the more important Acts will here be given.

PUBLIC HEALTH ACT, 1875 (SECTIONS 116-119).

Section 116 empowers any M.O.H. or inspector of nuisances at any reasonable time (even Sundays) to examine any carcase, flesh, fish, fruit, vegetables, corn, bread, flour, or milk, exposed for sale for human food, or intended for human food (proof to the contrary resting with the party charged). If any appear *diseased, unsound, unwholesome, or unfit for human food*, he may seize it, and carry it, or have an assistant carry it, to a justice for judgment.

Section 117.—If the justice believes the food (brought to him according to Section 116) to be unfit for human con-

sumption he shall condemn it, and order it to be destroyed, or dealt with in such a manner as to render it impossible to be used for human food. The person responsible is liable to a fine, not exceeding £20, for every carcase, piece of flesh, or parcel of food, so condemned, or, at the discretion of the justice, to imprisonment for not more than three months without a fine.

Section 118 renders liable to a penalty of not more than £5 fine, any person who prevents, obstructs, or hinders, the M.O.H. or inspector from examining food according to *Section 116*.

Section 119.—Any M.O.H., inspector of nuisances, or other officer of the local authority, having reasons for believing that articles (enumerated in *Section 116*) intended for human food are being kept or concealed in any premises, can, on complaint made on oath to a justice, obtain a warrant to search such premises, and carry away any such food to a justice for judgment. Penalty for obstruction not to exceed £20.

PUBLIC HEALTH (AMENDMENT) ACT, 1890 (PART III.,
SECTION 28).

Part III. includes any district in England and Wales in which it has been adopted under the provisions of the Act.

Section 28.—(1) Amends the Public Health Act, 1875, Sections 116-119, by including *all articles intended for the food of man*.

(2) Enables the justice to give an order to destroy an article of food (as in *Section 117*, Public Health Act, 1875) on complaint made by M.O.H. or his inspector, without the food having first been seized and brought to the justice, if he is satisfied that such food is unfit for human consumption.

PUBLIC HEALTH (LONDON) ACT, 1891 (SECTION 47).

Section 47.—1. Any medical officer of health or sanitary inspector may at any reasonable time (even on Sunday if necessary) enter any premises, and examine any *animals*

and any articles, solid or liquid, intended for human food, whether exposed for sale, deposited for the purpose of sale, or being prepared for sale. Proof to the contrary rests with the person charged. If such animal or article of food appears in any way unfit for human food, the medical officer of health or the inspector may seize it, and carry it, or have it carried for judgment to a justice.

2. Any animal or article of food so seized shall by order of the justice, if he thinks proper, be condemned and destroyed, or so dealt with as to prevent its being used for human food. The person responsible shall be liable (1) to a fine not exceeding £50 for every animal, etc., so condemned, or (2), at the discretion of the court, to not more than six months' imprisonment without a fine.

3. Any article liable to be seized under this section, if found in the possession of any person who bought it in a condition unfit for human food, renders the person who sold it liable to a fine or imprisonment, unless he proves that at the time of its sale he neither knew nor believed it was in such a condition.

4. If previously convicted for a similar offence within the last twelve months, the court may, if both offences were wilful, order that a notice of the fact be posted, for not more than twenty-one days, on any premises occupied by the offender, and that he pay the cost of affixing such notice. Obstructing the fixing of such notice, or destruction or removal of such notice within the twenty-one days, carries with it a penalty not exceeding £5.

5. If the offender under this section is the occupier of a licensed slaughterhouse, the court may cancel his licence.

6. Obstruction in the discharge of his duties of an officer bearing a warrant of entry into the premises, if offered with intent to conceal an offence under this section, carries the liability of one month's imprisonment instead of the usual fine.

7. The justice convicting an offender under this section need not be the same justice who had condemned the article of food.

8. Any person possessing food unfit for human consumption may by written request sent to the sanitary authority, with a detailed description of the article, obtain its removal as if it were trade refuse.

PUBLIC HEALTH (FOREIGN MEAT) REGULATIONS, 1908.

Article I.—(h) An ‘official certificate’ in relation to foreign meat, whether in boxes or packages, etc., is defined as a certificate, label, mark, stamp, or other voucher—recognition of which was published in the *London Gazette*—to the effect that the cattle or pigs from which the meat is derived were passed at the time of slaughter as free from disease, and that the meat was dressed, prepared, and packed with recognized care.

(i) Defines ‘Foreign Meat Class I.’ as meat that is in the form of—

(a) Fresh, frozen, preserved, or coloured: (1) Indefinite scraps of carcase; (2) meat pieces not prepared for consumption; (3) meat without bone naturally attached.

(b) Stomach, tongue, or kidney preserved in anti-septics (of which a list is given).

(c) Portions of pig not salted, dried, etc., and without an ‘official certificate’ on the package.

(j) Defines ‘Foreign Meat Class II.’ as unprepared (*i.e.*, salted, dried, etc.) entire carcasses of pigs from which the head has been detached and the various lymphatic glands removed.

(k) Defines ‘Foreign Meat Class III.’ as unprepared (*i.e.*, salted, dried, etc.) severed carcasses of pigs (not including foreign meat of Class I.), contained in a package, etc., attached to which is an ‘official certificate.’

(l) Defines ‘Foreign Meat Unclassed’ as foreign meat in such a form that it cannot be included in Classes I., II., or III.

(m) Defines ‘importer’ as the entitled possessor of the foreign meat in this country.

Articles III., IV., and V., require that all foreign meat considered as belonging to Class I. or Class II. be condemned, but that foreign meat Class III. or Unclassed be judged on its merits. The M.O.H. gives in duplicate, written certificates permitting the removal of the foreign meat, (1) to the officer of Customs, (2) to the importer; and gives in triplicate, written notices prohibiting its removal, (1) to the officer of Customs, (2) to the importer, (3) to the sanitary authority.

All such notices or certificates must contain an identifying description of the consignment certified.

Articles VI., VII., and VIII., require that the importer must either (1) prove the condemned meat to be 'not for sale as human food,' or (2) must within twelve hours undertake to export it in three days. The importer failing to do either, the condemned meat shall be destroyed by the sanitary authority.

Article X. orders that identification details of every consignment of foreign meat destroyed by the sanitary authority must be kept twelve months, and that notice of the destruction, with a copy of the identification details, must be sent to the importer.

SALE OF HORSEFLESH, ETC., REGULATION ACT, 1889.

This Act includes the flesh of asses and mules (Section 7), and is not intended to prohibit the sale of a cheap, wholesome food, but to prevent its being sold under a false name.

Section 1 requires that a notice, to be printed in letters 4 inches long, and indicating that horseflesh is sold on the premises, shall be legible during all business hours, both day and night.

Section 2.—No person shall supply horseflesh for human food to a purchaser who has asked for other meat.

Section 3 empowers any M.O.H., or officer appointed for the purpose, to examine at all reasonable times any meat which he believes to be horseflesh, intended for human food, but not kept in premises such as are required by

Section 1. He may have such meat carried to a justice for judgment.

Section 4 empowers any M.O.H., or officer appointed for the purpose, to obtain from a justice, by complaint on oath, a warrant to enter any building (not fulfilling the conditions required in Section 1) in which he believes is kept horseflesh intended for human food. He may search for and seize any suspected meat for the justice to deal with.

Section 6 permits a penalty not exceeding £20 to be imposed for every offence under this Act.

SALE OF FOOD AND DRUGS ACT, 1899.

Section 26 amends Section 2 of the 1875 Act by defining 'food' as including every article (other than drugs and water) used for food or drink by man, and any article which ordinarily enters into or is used in the composition or preparation of human food, including flavouring matters and condiments.

SALE OF FOOD AND DRUGS ACT, 1875.

Section 3.—No person shall *mix, colour, stain, or powder* (or permit any other person to do so), any article of food with any ingredient or material that renders the article injurious to health, with intent to sell the same in that state; and no person shall sell any article so altered under a penalty of £5 for the first offence, and six months' hard labour for succeeding offences.

Section 5.—No person is liable to conviction under Section 3 if he can satisfy the justice that he did not know the article of food or the drug sold by him had been so mixed, coloured, stained, or powdered, and that he could not with reasonable care have known it.

Section 6.—No person shall sell, to the prejudice of the purchaser, any article of food or any drug which is not of the nature, substance, and quality, demanded. Penalty not exceeding £20. Unless (1) the ingredient added is not injurious to health, and was added for the production or

preparation of any article of commerce ; (2) the food is proprietary or patented, and is supplied as specified in the patent ; (3) the ingredient is unavoidably added in the process of collection or preparation.

Section 7.—All compounded drugs or articles of food must be composed of the ingredients asked for by the purchaser. Penalty not to exceed £20.

Section 8.—The seller is not liable, if the ingredient added is neither injurious to health nor added for deceptive purposes, provided the purchaser receives with the drug or article of food, a legible and distinct label stating that it is mixed.

Section 9.—For selling an article of food, the quality, substance, or nature, of which has been altered by part of it having been abstracted, anyone is liable to £20 fine, unless disclosure of the alteration is made at the time of sale.

Section 13 permits any M.O.H., inspector of nuisances, inspector of weights or measures, inspector of a market, or any police constable, acting under orders of the local authority, to obtain samples of food or drugs for analysis.

Section 14.—After buying an article of food or a drug for analysis, the purchaser shall notify the seller of his intention, and shall divide the article into three parts, each marked and sealed. One part he shall offer to the seller, one he shall send to the analyst, and the third part he shall retain for future comparison.

Section 17 imposes a fine of £10 for refusal to sell to an authorized official a reasonable quantity of food or drug exposed for sale.

Section 25.—The defendant shall be acquitted if he prove that he bought the condemned article in the same state as that in which he sold it (with a written warranty of its genuineness). Unless he gave the prosecutor seven days' notice that he is adopting 'defence of warranty,' he shall pay the costs of the action.

SALE OF FOOD AND DRUGS ACT, 1879.

Section 2.—It is no defence to say that, as the article was bought for analysis, the purchaser was not prejudiced by such sale. Nor is it a defence to prove that the article of food or drug, although defective in nature, or in substance, or in quality, was not defective in all these respects.

BY-LAWS WITH RESPECT TO SLAUGHTERHOUSES.

Sections 1, 2, and 3.—Applicants for a licence to erect and occupy a slaughterhouse, or to occupy premises as a slaughterhouse, shall forward to the sanitary authority a special form with all particulars filled in.

Sections 4 and 5.—Successful applicants are entitled to receive from the sanitary authority a licence on a recognized form.

Section 6.—Successful applicants shall register such premises at the office of the sanitary authority by written notice to the clerk of the sanitary authority, who must within a reasonable time enter the specified particulars in the register.¹

Section 7.—The M.O.H., inspector of nuisances, surveyor of the sanitary authority, or any of the committee appointed by the sanitary authority for the purpose, shall at all reasonable times have free access to inspect the premises.

Section 8.—Any animal kept on the premises before slaughter, must be provided with a quantity of water sufficient for its consumption.

Sections 9 and 10.—All slaughtering must be done with as little pain as possible, and the larger animals must have their heads fastened before being stunned.

Section 11.—No animal is to be slaughtered in view of another animal.

Section 12.—No refuse or blood is to be within sight or smell of any animal in the slaughterhouse.

¹ The Public Health Act, 1875, Section 170, requires that the words 'Licensed Slaughterhouse' or 'Registered Slaughterhouse' be fixed on the premises, within one month of registration, and kept undefaced.

Section 13.—The arrangement for ventilation must be kept efficient and in good order, and in direct communication with the outside world.

Section 14.—The drainage system must be kept efficient and in good order.

Section 15.—The walls, floor, and pavement, must be kept in good order to prevent absorption of filth, etc. Every internal surface above the floor must be limewashed at least once between the 1st and 10th of March, once between the 1st and 10th of June, once between the 1st and 10th of September, and once between the 1st and 10th of December. Every part of the wall, floor, or pavement, which is soiled during the process of slaughtering must be washed and cleansed within three hours after being soiled.

Section 16.—No dogs are to be kept in a slaughterhouse, and no food animals are to be kept there, except in preparation for slaughter on those premises. Cattle must not be kept there for a longer period than is necessary for preparation, but must be kept in the pounds, stalls, pens, or lairs provided on the premises.

Section 17.—Within twenty-four hours of slaughtering an animal, its hide, skin, fat, and offal, must be removed from the premises.

Section 18.—The water-supply system must be in good order, and the water sufficient to enable thorough washing and cleansing of the floor, of the internal surface of the walls, and of every vessel, etc., used on the premises.

Section 19.—A sufficient number of galvanized iron or other non-absorbent vessels (with close-fitting covers) must be provided for the removal from the premises of all blood, manure, and other refuse, resulting from the slaughter and dressing of the carcasses. After slaughtering any cattle or dressing any carcase, all the resulting blood, manure, and other refuse, must be deposited in the vessels provided, and removed from the premises once every twenty-four hours. Every such vessel must be cleansed immediately after use, and kept clean when not in actual use.

Section 20.—Every person offending against these regula-

tions is liable to a penalty of not more than £5, and in the case of a continued offence to not more than 10s. for every day that such nuisance continues after the conviction for the first offence.

Methods of Slaughtering.

The two essentials in the slaughtering of animals for food are to avoid unnecessary pain by making the death sudden, and to make the 'bleeding' of the carcase as complete as possible. The total amount of blood in the animal body is about 8 per cent. of the body weight; but even with the most thorough bleeding there always remains a residual quantity of blood in all the organs. This amount should be so small that squeezing will not produce any blood-points on the cut surface of the organ. By the most thorough bleeding, however, the blood obtained amounts to only about 5 per cent. of the body weight.

The Jewish method of slaughter is to bleed without previously making the animal unconscious. All other methods, however, first render the animal unconscious.

The flesh of an animal incompletely bled, or of one that has died naturally, is darker and has a larger blood-content than normal flesh. The subcutaneous and visceral veins are also distended with blood.

In animals exhausted by transportation or disease, bleeding is often, if not always, incomplete. There are various methods of slaughtering our food animals, but a few words will suffice to explain these. Given alphabetically, the five common methods are: (1) Cutting the throat; (2) pithing; (3) poleaxing; (4) shooting; (5) stunning.

1. **Cutting the Throat.**—The large vessels of the neck are severed with a knife, without first rendering the animal unconscious. This is the Jewish method for cattle, and is the usual method for calves and sheep. It is also often adopted for exhausted animals, to make the bleeding more complete than it would otherwise be. In this way bleeding as complete as possible is obtained; for the nervous centres

have not been destroyed, and the blood-pressure, therefore, is not reduced at the start. The final reflex muscular spasms also assist in expelling the blood.

The preparations for the slaughter as practised are often gruesome, cruel, and unnecessarily long.

2. **Pithing.**—A sharp-pointed knife is driven between the occipital bone and the atlas (at the nape of the neck, just behind the ears), dividing the spinal cord. The animal is then bled by cutting the large vessels at the root of the neck. This method results in an incomplete bleeding, as the heart centre, respiratory centre, and vasomotor centre, are rendered useless, and the bleeding process is deprived of the help of the heart's action, of breathing, and of reflex muscular contractions. The animal is not unconscious until rendered so by cerebral anæmia.

3. **Poleaxing.**—A heavy hammer, consisting of a handle with an iron cylinder about 4 inches long, set at right angles at the end, is used to stun the animal, and at the same time to punch in the forehead a hole through which a cane is pushed to destroy the brain function. The animal is then bled by cutting the large bloodvessels at the root of the neck. Owing to the destruction of the nervous centres in the medulla oblongata, this method does not effect complete bleeding.

4. **Shooting.**—A flat iron mask, from which a pistol-barrel projects, is held or strapped on to the forehead. A light blow discharges the ball cartridge into the brain. The animal is then bled in the usual way.

5. **Stunning.**—A violent blow with a hammer on the forehead renders the animal unconscious, and it is then bled. This is probably the most humane method of slaughtering food animals, and by its means the nervous centres of the brain are not destroyed, so that a thorough bleeding is obtained.

There are on the market numerous instruments intended for slaughtering food animals, but most of them will be found to come under one or other of the methods which have been briefly described above.

Dressing the Carcase.

After slaughter, and as soon as the bleeding is completed, the process of dressing the carcase is commenced. In cattle, sheep, and horses, the hide is removed; but in the case of pigs, the skin is left on—deprived, however, of its hair either by singeing or scalding. Singed pork has the reputation of keeping better, but the inspection of the skin is thereby rendered more difficult. Calves are disembowelled and hung up in their skins, as by this method the flesh retains a darker and better appearance.

‘Dressing’ the Carcases of Cattle.—A suitable occasion for examining the feet presents while the beast is being bled. When the bleeding is complete, the carcase is turned on its back, and the skin incised down the middle of the abdomen from the root of the neck to the pubis, and stripped off as far as possible towards the backbone. This brings into view the subcutaneous tissue, the udder and its lymphatic glands, and affords a good opportunity for observing the fulness of the subcutaneous veins, signs of hæmorrhage, or dropsy. The abdominal wall is now opened by a cut from the breast-bone (sternum) to the pubis, exposing the peritoneum, stomach, and intestines. These latter are removed from the abdominal cavity with the mesenteries (‘caul’), bringing into view the liver and the contents of the pelvis (uterus, bladder, and rectum). At this stage notice should be taken of any signs of ascites or peritonitis. In cattle the spleen is removed attached to the stomach, in pigs it is removed in the mesentery, and in calves and sheep it is left in the abdominal cavity. The bladder, uterus, and rectum, are next removed, and then the liver. (In calves, sheep, and pigs, the liver is removed with the lungs and heart, the three constituting the so-called ‘sling.’) The sternum is divided down the middle line, exposing the pleura, heart, and lungs, which are all removed. The carcase is now raised by the hind-quarters and suspended in an upright position, the skinning process completed, and the limbs divided at the carpal (knee) and

tarsal (hock) joints. The head is removed from the trunk at its junction with the neck, hung up by the muzzle, and the tongue stripped down from between the rami of the

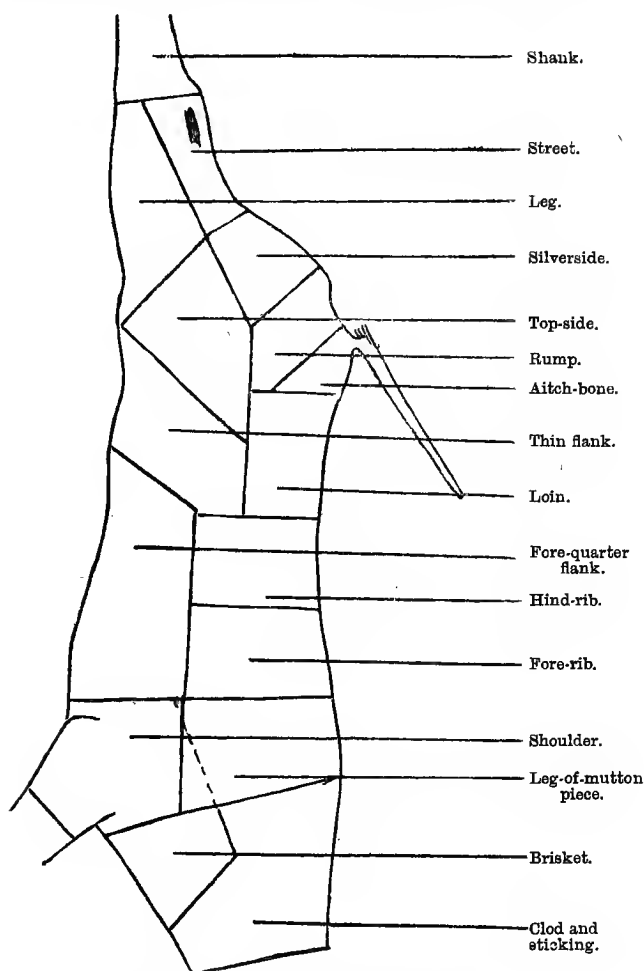


FIG. 1.—LONDON CLASSIFICATION OF BEEF.

The leg-of-mutton piece covers the 'chuck.'

lower jaw, thus exposing the retropharyngeal lymphatic glands on either side of the root of the tongue. The

'dressing' is completed by splitting the carcase down the middle of the backbone.

The carcase having been slung up and split, the two halves should be examined according to the method to be described later. After having been allowed to 'set,' the carcase is finally divided into the various 'joints.' A good

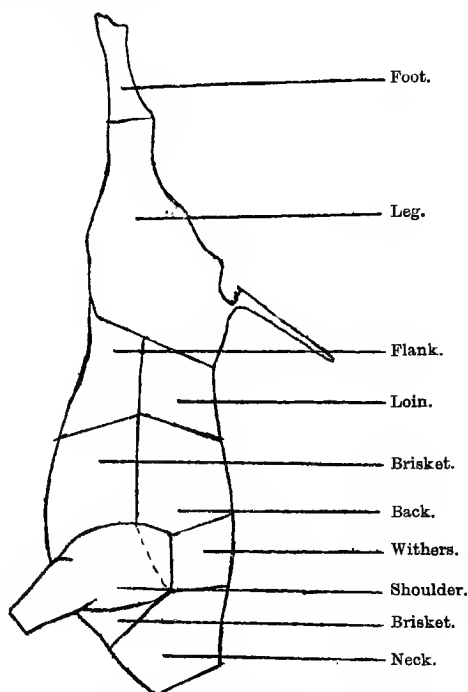


FIG. 2.—LONDON CLASSIFICATION OF VEAL.

idea of the London method of classification can be obtained by reference to the accompanying diagrams. The colour and condition of the flesh should be noted, though the latter cannot fairly be judged till twelve hours after slaughter. A freshly cut surface should always be examined, as parts exposed to the air may be rosy, whilst underneath the flesh may be very dark and repulsive. Attention may here be drawn to the fact that a carcase

which the butcher expects to be condemned is often carelessly 'dressed.'

If possible, the carcases should always be examined in daylight, as jaundice and other changes in colour may otherwise be easily overlooked.

Slaughter and Dressing of the Carcases of Pigs.—The pig is caught, and held steady by a running noose over the upper jaw behind the tusks. Thus held, it is stunned by a

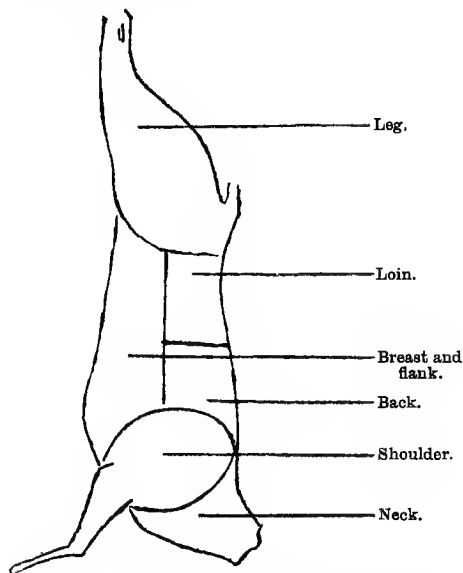


FIG. 3.—LONDON CLASSIFICATION OF MUTTON.

blow on the forehead with a hammer, and the large vessels at the entrance to the thorax severed by a knife-thrust, the knife usually at the same time piercing the heart. The pig is held till the death spasms occur, and is then raised by the hind-legs to assist the bleeding. When dead, the carcass is thrown into a trough of boiling water, and the process of 'scraping' is commenced with small hoes. When most of the hair has been removed, the carcass is lifted out by a pulley, deposited on a trolley, and the remainder of the hair removed with sharp knives. If

thrown into the boiling water too soon—*i.e.*, before the bleeding is complete—the skin itself is scalded, and after scraping appears red, owing to an inflammatory reaction of the still living skin. On the other hand, if not thrown into the boiling water soon enough, the process of ‘scraping’ is rendered more difficult, and time is wasted. The average time to allow between stunning and scalding is about three

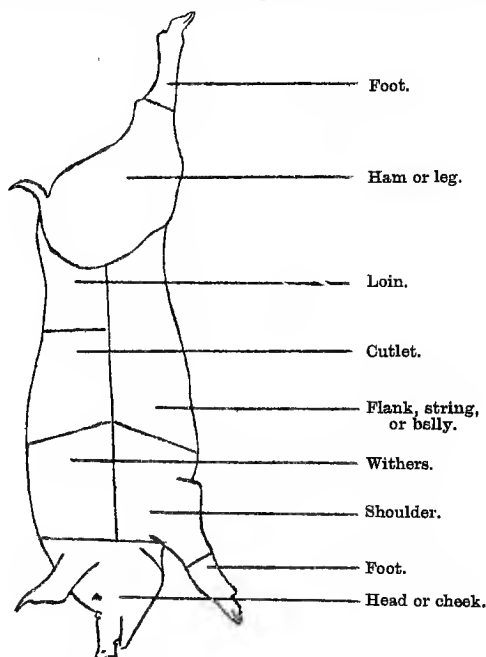


FIG. 4.—LONDON CLASSIFICATION OF PORK.

or four minutes. Having scraped and cleaned the skin, the carcass is suspended by the hind-legs and the process of dressing commenced. This differs very little from the method described for cattle. The skin is divided down the middle line from the chin to the pubis. The sternum is split in the median line, the navel cut out, and the abdomen opened. Having thus exposed the bowel, the anus is cut round, and the rectum liberated from its attachments. Seizing the rectal end of the large intestine, the rectum is

pulled out of the pelvis into the abdominal cavity proper, and the intestines removed from the abdomen. This is effected by dividing the mesentery along its vertebral attachment, and severing the œsophagus as it passes through the 'skirt' (diaphragm). The diaphragm is then cut on either side of its tendinous centre, and the tongue liberated from between the rami of the lower jaw, so that the tongue, windpipe, lungs, heart, and liver, can be removed in one ('sling'). The common bile-duct is divided, and the gall-bladder removed from the liver. Having removed the bladder, and in the female the uterus, the pelvis is divided down the middle and the carcass 'split.' (In the male, the penis remains on the *left* half of the carcass.) Attention is then turned to the bowels; the omentum, mesentery, and spleen, are separated, and the intestines emptied and cleaned.

Inflation of the Carcass.

This term includes two practices: (1) Subcutaneous inflation; (2) inflation of the lungs.

1. **Subcutaneous Inflation.**—Carcasses of calves and sheep are sometimes skinned by making a puncture through the skin and forcing in air. The puncture is then closed, and the air distributed by squeezing and striking with the hand. This results in a subcutaneous emphysema, renders the process of skinning easier, and increases the apparent value of the meat by making the carcass look more plump. It gives a peculiar glistening sheen to the subcutis, and makes it feel spongy, and crackle when fingered. It also, by the pressure it exerts, drives the fluids from the subcutis deeper into the carcass, and thus increases the keeping power of the meat.

There is nothing to object to in this practice, provided the air is forced under the skin with bellows; but the habit of 'inflating' from the butcher's lung is objectionable, and should be prohibited.

2. **Inflation of the Lungs** with air is performed after slaughter, and before rigor mortis sets in. It is done with

the idea of making the lungs appear larger and more appetizing. That it has been performed can be recognized by the mediastinal surfaces of the lungs being in contact, the borders of the lungs being sharp, and the anterior lobe being straight and stiff instead of drooping as it would otherwise do. A similar result is obtained by forcing apart the walls of the opened abdomen by means of wooden sticks, by this means increasing the size of the chest and sucking air into the lungs. In this case, however, the anterior lobes will be found drooping.

Judgment.—These practices are now so universally carried out that the parts cannot, for this reason alone, be condemned. Inflation, however, by means of the mouth should be prohibited.

Rigor Mortis.

Rigor mortis is the 'setting' or 'firming' of muscles after death. The changes that characterize this condition are stiffening of the muscles, which at the same time lose their glistening appearance and become turbid and opaque.

Normal muscle has a neutral or alkaline reaction, but after death this reaction becomes acid owing to the liberation of sarcolactic acid and volatile fatty acids (see Meat-Poisoning). These acids have a coagulative effect on one of the normal constituents of muscle, myosin, and as a result of this coagulation the muscle becomes stiff and opaque. These acids continue to increase in quantity until sufficient is present to dissolve the previously coagulated myosin (coagulated myosin is soluble in a 5 per cent. solution of lactic acid). When this has occurred, rigor mortis disappears, and the muscles become soft and supple. Rigor mortis makes its appearance about fifteen minutes to three hours after death, and the muscles first affected are usually those of the head and neck. Animals that are fatigued from muscular exertion at the time of slaughter, or that have been hunted to death, often develop rigor mortis within a few minutes of death. Rigor mortis is usually complete in twelve hours from the time of death,

and lasts from one to four days. It passes off most quickly in those carcasses in which it appears first.

Removal of the brain and spinal cord after slaughter, causes rigor mortis to pass off more quickly than would otherwise be the case.

Meat that is eaten before having undergone the change is tough and tasteless, as the acid formation occurring with rigor mortis softens and gelatinizes the fibrillar connective tissues, and loosens the muscle fibres, thereby making it more palatable and tender. The most palatable meat is obtained by hanging in the cold two or three weeks before it is eaten. A household method of rendering meat tender, is the application of sour milk (lactic acid) or vinegar (acetic acid) to its surface before basting.

CHAPTER II

The normal body. Local names and dentition of cattle, and other methods of recognizing the age of carcasses—Recognition of sex in beef carcasses, and the normal appearance of a carcass—Beef fat—Veal and slink veal. Local names and dentition of sheep—Flesh of sheep—Flesh of goats. Local names and dentition of pigs—Flesh of pigs and pig-fat. Horseflesh—Estimation of glycogen in horseflesh.

The Normal Body.

Blood.—*Colour* : Normal blood differs in colour according to the type of bloodvessel containing it. In the arteries it is scarlet-red, whilst in the veins it is dark red. The latter colour, however, soon becomes scarlet on exposure to the air. *Odour* : The blood of the different food animals has its own specific odour. This peculiarity can be made more marked by adding to the blood some sulphuric acid. *Coagulation* : In dead animals the blood coagulates quickly in the heart and large vessels, but in the small vessels and in the capillaries it remains uncoagulated for some time. *As Food* : The blood of pigs and calves is occasionally used for making 'blood sausages.' Apart from this, blood is rarely used for human food. To utilize cow's blood for sausage-making, it is necessary to add milk to the blood, in order to do away with the dull, rough, crumbly cut surface which otherwise results. *Contamination* : It should be remembered that during the process of slaughtering and dressing the blood is usually contaminated by the contents of the stomach and intestines, and is therefore unfit for usage as human food, unless this contamination is avoided.

Bone Marrow.—Bone marrow is found in large quantities in the long round bones, and in appreciable quantities in many of the flat bones. It is always firm, except in the

case of disease of the bones, but varies somewhat in colour. Two forms of bone marrow are recognized :

1. *Red Marrow*.—This is present in all the bones of newly-born or unborn animals. After birth it disappears from the long round bones, persisting only in the skull bones, scapula, pelvis, sternum, ribs, and vertebræ.

2. *Fat Marrow*.—This is white or yellow in colour, and, though firm, it is soft. It replaces the red marrow of the long round bones soon after birth.

Heart.—In all the food animals this organ is of a brownish-red colour, and has a smooth, transparent, glistening membrane externally (epicardium), and a similar lining for its cavities (endocardium). It is firm, and on cross-section should show very little blood in its substance, and only a small quantity of coagulated blood in its two ventricles. Immediately after slaughter the heart tissue (myocardium) under the endocardium is often injected around the muscular prominences (columnæ carneæ), but not elsewhere. This is the result of the cessation of the heart's action whilst contracting. The injection becomes more marked when the fresh heart is washed (Von Hofmann).

In *oxen* the heart is pointed, and freely supplied with *firm white* fat in its external furrows. Frequently a T-shaped bone can be found at the base of the left ventricle. Such a bone is occasionally found in the right side of the heart of old sheep.

In the *horse* the heart is blunter, and is scantily supplied with a *soft yellow* fat on its outer surface. The T-shaped bone is never present.

Kidneys.—These are two in number, and in their natural position are concealed from immediate view by an immense deposit of fat in the lumbar region of the abdominal cavity. The kidney and its lymphatic gland will be found buried in this collection of fat, one on each side of the lumbar vertebræ. There is very little variation in colour, the kidneys of all the food animals being reddish-brown or chocolate-coloured. They are provided with a smooth, transparent, glistening, capsular membrane.

In *cattle* both kidneys are oval and markedly lobulated, showing as many as fifteen to twenty deeply separated lobules. This is the only food animal in which lobulation is distinct.

In the *horse* the two organs are of different shape; that on the left side is oval or bean-shaped, whilst the right kidney is heart-shaped. They have a uniform surface and show no lobulation.

In the *sheep* and *goat* the kidneys are simple, bean-shaped, and not lobulated.

In the *pig* the kidneys are simple, oval, and much flattened.

In the *dog* they are simple, bean-shaped, and show very markedly a network of bluish-red bloodvessels under the capsule. This enables one to distinguish a dog's kidney from other kidneys of the same size.

Liver.—This organ is to be found on the abdominal side of the diaphragm ('skirt'). Its normal colour is a shade of brown. If the liver is very full of blood, the colour approaches a dark red, the yellow tinge of the brown being obscured. When devoid of blood, however, or when 'fatty,' its colour is distinctly lighter than normal.

In *cattle* it is distinctly two-lobed, consisting of one large left lobe with a small ill-defined right lobe. It has a pear-shaped gall-bladder and no œsophageal notch.

In the *horse* it consists of four lobes: a large left lobe, a right lobe of nearly equal size, and a small middle lobe. The fourth lobe consists of a small piece of liver tissue, about the size of a duck's egg, projecting from the upper part of the right lobe. There is no *gall-bladder* in the horse.

In *sheep* the liver is similar to, but smaller than, that of cattle.

In the *pig* the liver consists of five lobes of nearly equal size. The individual lobules are marked very distinctly, and are visible with the naked eye. The liver is provided with a gall-bladder.

The liver of the *dog* consists of two lobes of equal size,

Lungs (or Lights).—These organs should be spongy and elastic, and should contain little blood. The surface should be smooth, moist, glistening, and of a rosy red colour. Through the transparent pleura covering them, the lungs will be seen to be divided into small irregular-shaped areas. On pressure with the fingers the lungs crepitate.

In *cattle* and *sheep* the left lung consists of four distinct lobes, and the right lung of four or five lobes. The anterior lobe of the right lung receives its bronchus

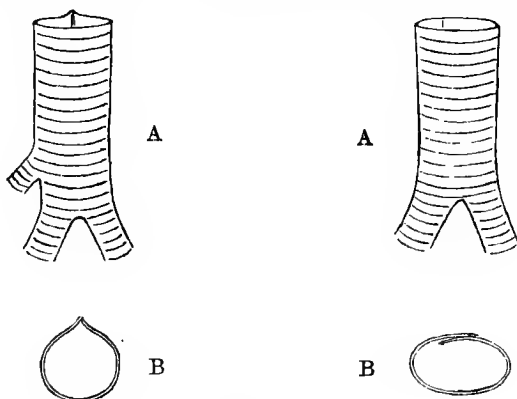


FIG. 5.

TRACHEA OF AN OX, SHOWING
ACCESSORY BRONCHUS.

A, Viewed from in front ;
B, cross-section.

TRACHEA OF A HORSE.

A, Viewed from in front ;
B, cross-section.

independently from the end of the trachea (windpipe), so that the trachea appears to divide into three bronchi. The ends of each individual ring of the trachea come together at an angle, so that collectively the rings form a sharp ridge running the whole length of the windpipe (Fig. 5).

In the *horse* the left lung is made up of two lobes (anterior and posterior), and the right lung of three lobes. No accessory bronchus is given off from the end of the trachea, which divides into the right and left bronchi. The ends of the individual rings of the windpipe overlap, so that there is no prominent ridge as in *cattle* and *sheep*.

In the *pig* the left lung consists of three lobes, and the right lung of four lobes.

Lymphatic Glands.—It is very necessary that a meat inspector should know the situation of the important lymphatic glands, their appearance in health and disease, and the area from which they receive their lymph ('contributory area').

Appearance in Health.—The glands may be either round or oval, and may vary in size from that of a pea to that of a walnut, or be even larger. In young growing animals they are larger than in fully-grown adults. On section each normal gland shows two distinct parts or zones—a central grey-blue zone and an outer white zone. In pigs the white zone is unusually large as compared with the central zone; but in other animals the division is nearly equal. Each gland is soft, but firm, those of the abdomen being softer than those found elsewhere. A gland when cut is always moist, and from the cut surface a clear liquid oozes. Lymphatic glands normally vary much in size and water content, but marked changes result from intense irritation.

Each group of glands has a special 'contributory area,' but this same area may supply with lymph more than one group of glands. No lymphatic vessel ever discharges its lymph into the thoracic duct until the lymph has passed through at least one lymphatic gland.

LYMPH GLANDS OF THE FORE-LIMB AND HEAD AND NECK.

Brachial Lymph Glands.—These occur in two groups: (1) On the inner or median side of the limb, along the posterior border of the main bloodvessels, about the level of the middle of the humerus; (2) a small group around the main bloodvessels, just above the level of the elbow-joint. They receive their lymph from the outer part of the thoracic wall and the median surface of the scapular region.

Prescapular Lymph Glands are present in the form of a chain above and in front of the shoulder-joint, and covered

by the posterior or dorsal border of the sterno-mastoid muscle. They receive lymph from the superficial lymph glands of the neck, and from the shoulder and fore-limb. To expose them, make a deep incision above and in front of the shoulder-joint, parallel with the edge of the scapula (shoulder-blade).

Mid-Cervical Lymph Glands.—A chain of glands along the upper third of the trachea (windpipe).

Superior Cervical Lymph Glands (Retropharyngeal). An elongated cluster of glands in the lateral wall of the pharynx, towards its upper part (in the region of the thyroid gland). In cattle there is a large gland at the base of the skull, on each side, in the upper part of the pharyngeal wall. These all receive their lymph from the base of the skull, the pharynx, and the parotid region.

Parotid Lymph Glands are large, numerous, and red, in the pig. They occur as a group situated partly in the parotid salivary gland, along its maxillary border. They receive lymph from the ear, the temporal region, the parotid salivary gland, and the base of the skull.

Submaxillary Lymph Glands.—A group of glands on the inner or median surface of the lower jaw. In cattle they occur at the angle of the lower jaw; in pigs they nearly meet in the median line. They receive lymph from the nose and mouth.

LYMPH GLANDS OF THE THORAX.

Anterior Mediastinal Lymph Glands (Tracheal).—Always large in cattle. These occur as a double chain on the under-surface of the trachea, at its entrance into the thorax. They receive lymph from the heart, pericardium, and bronchial lymph glands.

Bronchial Lymph Glands.—A group of glands on each side at the bifurcation of the trachea, usually in a pad of fat. They connect the posterior and anterior mediastinal lymph glands, and also receive lymph from the lungs.

Posterior Mediastinal Lymph Glands are present in a chain along the course of the aorta and œsophagus. The most

posterior gland is very large in cattle. The chain receives lymph from the diaphragm, the anterior abdominal region, and the anterior surface of the liver.

Dorsal Lymph Glands (Superior Intercostal) (Fig. 6).—If healthy, these are difficult to find. They occur as small numerous glands along the dorsal vertebræ, in the upper limit of the intercostal spaces, and under cover of the internal intercostal muscle. They receive lymph from the vertebræ, back, intercostal muscles, diaphragm, pleura, and anterior part of the peritoneum.

Inferior Thoracic Lymph Glands (Sternal) (Fig. 6) are rarely present in pigs. In cattle (1) they form a chain on the sternum where the diaphragm crosses it, and receive lymph from the diaphragm; (2) they form a second chain along the course of the internal thoracic artery, under cover of the triangularis sterni muscle—*i.e.*, at the junction of the rib cartilages with the sternum. They receive lymph from the intercostal muscles and the rectus abdominalis muscle.

LYMPH GLANDS OF THE ABDOMINAL CAVITY (Fig. 6).

Lumbar Lymph Glands form a chain along the course of the aorta, under the lumbar vertebræ, and partly covered by the lumbar muscles.

Internal Iliac Lymph Glands.—One or two large glands situated at the bifurcation of the iliac artery; usually buried in a small roll of fat. They receive lymph from the pelvic organs, the lumbar muscles, and the upper part of the abdominal wall. The lymph from these glands passes straight into the thoracic duct.

Sacral Lymph Glands.—A chain of glands on the inferior surface of the sacrum, near each edge. They receive lymph from part of the rectum and the roof of the pelvis.

Ischiatic Lymph Glands.—A group of glands situated outside the pelvic cavity, immediately above the ischiatic notch, under cover of the broad ligament of the pelvis. They receive lymph from the tail, the rump, and the back of the thigh.

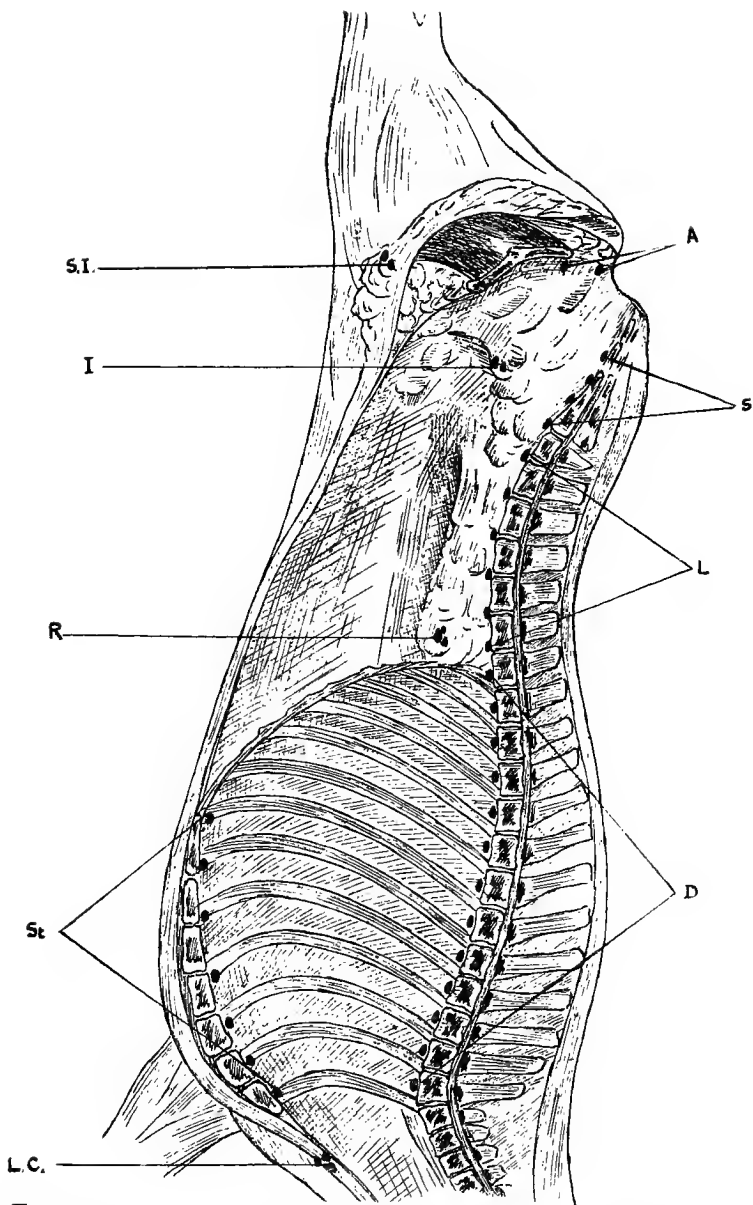


FIG. 6.—A 'HALF OF BEEF': INTERNAL VIEW, SHOWING THE POSITION OF THE LYMPHATIC GLANDS.

A, Anal ; D, dorsal or superior intercostal ; L, lumbar ; LC, lower cervical ; I, internal iliac ; R, renal ; S, sacral ; SI, superficial inguinal ; St, sternal (under cover of triangularis sterni muscle).

Mesenteric Lymph Glands occur in the form of a chain enclosed between the two layers of the mesentery, and following the concave arch of the bowel. Some are small and insignificant, whilst others are large and elongated. In pigs another chain of glands is present along the line of attachment of the mesentery to the roof of the peritoneal cavity. This chain receives lymph from the intestines.

Gastric Lymph Glands.—In ruminants these form a chain in the long groove of the rumen and along the attachment of the small mesentery. In the horse and pig the glands form one chain of large glands along the concave curvature of the stomach, and a second chain of small glands along the large or convex curvature.

Hepatic Lymph Glands.—In ruminants they form a group in the portal fissure around the neck of the gall-bladder. Pigs, besides those in the portal fissure, possess a chain of glands between the portal vein and the pancreas.

Splenic Lymph Glands.—A group of unusually small glands, situated near the hilum of the spleen. When the spleen is removed, they usually remain on the stomach wall.

Renal Lymph Glands form a group along the course of the renal arteries.

LYMPH GLANDS OF THE HIND-QUARTER.

Superficial Inguinal Lymph Glands.—A few glands, immediately under the skin, at the neck of the scrotum and the side of the penis. In females they are represented by the supramammary lymph glands, at the upper and posterior border of the udder. They receive lymph from the inferior part of the abdominal wall, the inner part of the thigh, in the male from the external genitals, in the female from the udder.

Deep Inguinal Lymph Glands.—A chain of small glands in the femoral canal, around the main vessels of the thigh. They receive lymph from the popliteal glands, the inner part of the thigh, and the penis.

Precrural Lymph Glands.—Usually a long, slender single gland, situated superficially between the external angle

of the ileum and the patella (kneecap). To expose it, make an incision in front of the stifle-joint, at right angles to the spinal column. They receive lymph from the thigh and flank.

Popliteal Lymph Glands.—A group of glands deep in the fleshy part of the back of the thigh. To expose them, make a transverse incision just above the middle of the back of the thigh. They are frequently absent in pigs, and are replaced by a small superficial gland situated in the hollow on the outside of the thigh, about 2 or 3 inches above the point of the hock. They receive lymph from the lower part of the hind-limb.

The Peritoneum and Pleura.—These membranes should be moist, smooth, glistening, transparent, and of a pale blue-grey colour. A reddish tinge of either membrane may be due to blood spilt on it or to inflammation; if due to spilt blood, the red tinge is removed by washing. Injuries to the gall-bladder in the slaughterhouse may give the peritoneum a yellowish-green colour.

Spleen (or Melt).—The spleen is of different shape in each sort of our food animals, whilst in individuals it varies much in size.

In *cattle* it is an elongated oval shape, and much flattened. Its consistence is flabby. In cows its colour is usually a greyish-blue, and in oxen a reddish-brown. The Malpighian bodies can usually be seen as whitish nodules, about the size of a common pin's head.

In the *horse* the spleen is flat and sickle-shaped. In consistence it is flabby. In colour it is blue-violet immediately after slaughter, but soon turns to a dark red-brown. The Malpighian bodies are not visible.

In *sheep* and *goats* this organ resembles that of cattle, but is of a reddish-brown colour.

In *pigs* it is flat, tongue-shaped, and flabby. Its colour immediately after slaughter is a bright red, but soon becomes dark red. The Malpighian bodies are very marked.

Skin.—In the pig only is the skin used for human food. Pig's skin is elastic and pure white, particularly after scalding. If the carcass is improperly bled, scalding sometimes results in the formation of red blotches on the skin, owing to signs of life being still present in the skin. In old sows the skin becomes uniformly hard, and in old boars that of both sides of the chest becomes cartilaginous, forming the so-called 'shield.'

Stomach and Intestines.—The peritoneal surface of these organs should be moist, smooth, and glistening, of a pale blue-grey colour. In the horse and pig the stomach consists of one sac, in cattle and sheep of four sacs. The intestines are used almost exclusively for making sausage-casings, and the second stomach (reticulum) of calves for making tripe and for obtaining pepsin and rennet.

Tongue.—In *cattle* the extremity of the tongue is pointed, and the fixed portion, or posterior one-third, has a prominent dorsal ridge covered with numerous pointed horny processes (filiform processes), which are directed backwards. There are also a dozen or more mushroom-shaped circumvallate papillæ.

In the *horse* the free portion of the tongue is flattened dorso-ventrally, and has a rounded extremity resembling a spatula. The fixed portion is thick and three-sided, with usually two mushroom-shaped circumvallate papillæ on its buccal surface.

In *sheep* the tongue is pointed, has a dorsal ridge as in cattle, and the free portion is grooved down the middle of the buccal surface. The filiform papillæ are blunt, and not horny. In dark sheep the tongue is frequently uniformly black or spotted black.

In the *pig* the dorsal ridge is absent, and the filiform papillæ resemble velvet-pile.

Adipose Tissue (Fat).—Adipose tissue in itself is not a special tissue, but only a modification of other tissues (*i.e.*, connective tissue, muscular tissue, etc.), and this modification in an extensive form is what one strives to obtain in order to bring the animal into a condition of so-

called 'slaughter maturity.' The development of adipose tissue takes place in regular localities, such as the kidney capsules, mesenteries, omentum, subcutis, intermuscular tissues, liver, and bone marrow. According to the degree of development of the adipose tissue, animals are classified as poor, fattening, partly fattened, and completely fattened.

'Poor' animals show fat only in the omentum, mesenteries, and kidney capsules.

'Fattening' animals have fat stored in the omentum, mesenteries, kidney capsules, and abdominal subcutis, this latter becoming more marked as the degree of fattening increases. There is also a deposit of fat in the scrotum of males, and in front of the udder in young cows.

'Partly fattened' animals have the fat stored in the same places as in 'fattening' animals, but in greater quantity.

'Completely fattened' animals have fat stored in the kidney capsules for a thickness of an inch or more, and there is a thick layer of fat in the mesenteries, hiding the lymphatic glands. The omentum also becomes opaque and thickened with deposited fat. Under the peritoneum and pericardium, also, fat is stored, whilst the liver becomes cloudy, enlarged, and its borders thickened.

The subcutis will be found loaded with fat, particularly on either side of the 'backbone.' Bones prominent in less fat cattle can no longer be seen or felt, and natural hollows become filled up. Streaks of fat have made their appearance between the muscular bundles and under the pleura.

Estimation of Fat Condition during Life.—Dealers in live-stock habitually determine the condition of food animals by palpation. In cattle the parts examined for this purpose are the angles of the haunch, between the buttocks and the root of the tail, the loins or false ribs, behind the shoulder-blade and the elbow-joint, in front of the stifle-joint, and in the region of the groin (scrotum and udder). In calves more importance is placed on 'feeling' below and behind the ears. In pigs the dealer 'feels' along the windpipe, sternum, ribs, abdomen, angle of the haunch, and the root

of the tail. In sheep the regions which it is important to palpate are the root of the tail and round the buttocks.

Normal fat is opaque, poor in blood, and has a marked acinous cross-section. Its consistency varies with the surrounding temperature. Till two weeks old, calves have fat only round the kidneys, and this is of a light greyish-red colour, unless the calf is 'fasting,' in which case the fat is gelatinous. At about four to six weeks of age this fat becomes firm and pure white, and finally disappears at about the sixth month.

In old animals, particularly cows, the adipose tissue disappears from many of the localities where it is normally deposited, leaving in its place a yellow gelatinous connective tissue. In pasture-fed cattle the fat is of an intense yellow colour, while the feeding of cattle on slop diet, oil-cake, or cottonseed meal, results in a soft, loose, yellow fat.

Fat animals fetch a better price than lean ones, as they have a better flavour, less water content, and more weight; but their nutritive value is less, because they are poorer in protein. Meat from moderately fat animals is the best, as it has a good flavour and a high protein content.

Dressed Weight.—By dressed weight is meant the weight of the carcase after it has been 'dressed.' It is the weight of an animal prior to slaughter minus the weight of blood lost, the skin, head, feet, and all the internal organs except the kidneys, which remain in the carcase. It is spoken of in terms of percentage of live weight, and although varying somewhat, according to the degree of fatness, is from 40 to 50 per cent. in cattle, 45 to 65 per cent. in sheep, 15 to 25 per cent. in pigs.

Live Weight.—In this country a common method for determining the live weight of an ox is by means of the formula $\frac{2}{3}(5L \times G^2)$, L being the length of the trunk from the front of the scapula to the root of the tail, and G the circumference or girth just behind the scapulæ. The result is expressed in pounds, deducting $\frac{1}{20}$ for very thin beasts, and adding $\frac{1}{20}$ for very fat ones.

Weight.—An ox should weigh from 600 to 1,200 pounds, a cow from 600 to 750 pounds, and a heifer from 350 to 500 pounds.

Carcases of Cattle.

Throughout the country there are various local names for cattle of various ages. Some of the commonest names are given below, but it is impossible to mention them all, nor is it necessary to do so.

Males.—A bullock or bull calf includes any male up to one year old.

A bull is an uncastrated male of more than one year old.

A segg is a male that was castrated after being used for service.

Steer, ox, stott, bullock, are all terms that are used for castrated males that have never served a cow.

Females.—Cow calf, heifer calf, or quey, includes any female up to one year old.

Yearling, two-year-old heifer, cow quey, and stirk, are all terms applied to females during their second and third years.

A cow is a female that has had a calf.

The ages of cattle during life are judged by the changes that occur, with advancing life, in their teeth and horns. After death an approximate idea can also be obtained by certain changes in the bony cartilages.

Dentition.—The normal number of teeth in cattle is expressed by the following formula :

	<i>Incisors.</i>	<i>Canines.</i>	<i>Molars.</i>
Temporary or milk teeth...	$\frac{0-0}{4-4}$	$\frac{0-0}{0-0}$	$\frac{3-3}{3-3}=20.$
Permanent teeth ...	$\frac{0-0}{4-4}$	$\frac{0-0}{0-0}$	$\frac{6-6}{6-6}=32.$

From the above formula it will be observed that cattle have no incisors of any description in the upper jaw, but eight in the lower jaw. These are named in pairs from within outwards: Central, inner-middle, outer-middle, and

corner. The corner incisors in cattle probably represent the canine teeth found in other animals, the canine teeth themselves being absent in cattle.

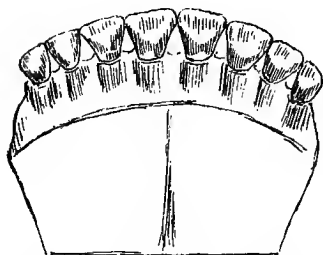


FIG. 7.—ONE YEAR OLD.
All 'milk' or temporary incisors.

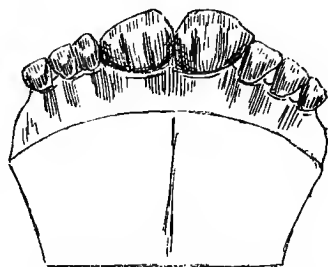


FIG. 8.—ONE AND A HALF YEARS OLD.

Central permanent incisors replace 'milk' teeth and come to full height at two years old.

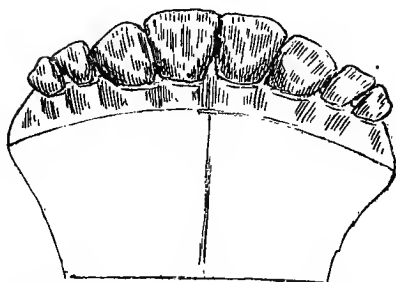


FIG. 9.—TWO AND A HALF YEARS OLD.

Inner-middle permanent incisors replace 'milk' incisors.

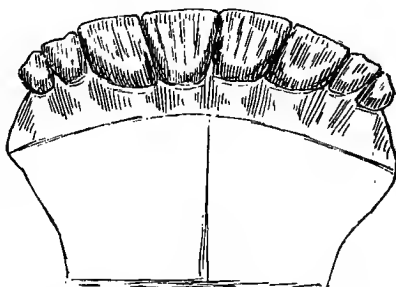


FIG. 10.—THREE YEARS OLD.

Inner-middle permanent incisors come into wear. Outer-middle 'milk' incisors replaced at three and a half years.

Arranged in tabular form is appended the number of teeth present, and the changes that occur in them at various ages.

INCISOR TEETH.

Temporary or Milk Teeth.

Six temporary incisors (the two central and four middle) are present at birth.

- The corner temporary incisors appear within the first week after birth.

The first six temporary incisors (two central and four middle) are free from the gums in fifteen days after birth.

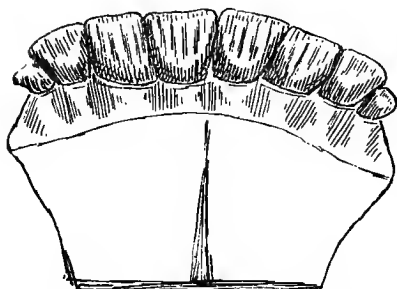


FIG. 11.—FOUR YEARS OLD.
Outer-middle permanent incisors come into wear.

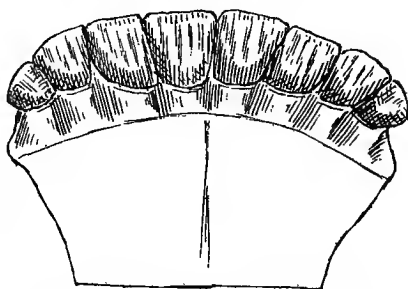


FIG. 12.—FOUR AND A HALF YEARS OLD.

Corner permanent incisors replace 'milk' incisors and come into wear at five years old.

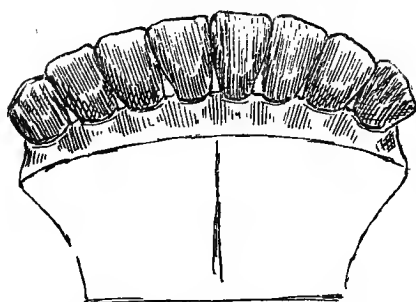


FIG. 13.—SIX YEARS OLD.
Central permanent incisors have an appreciable neck. Inner-middle incisors get a neck at seven years old.

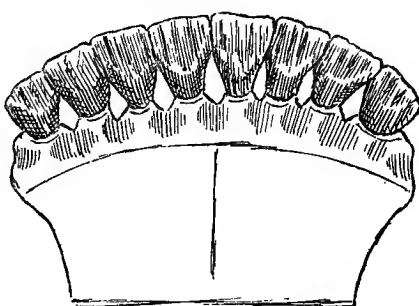


FIG. 14.—EIGHT YEARS OLD.
Outer-middle permanent incisors have a distinct neck. The corners get a neck at nine years old.

The corner temporary incisors are free from the gums in thirty days after birth.

Permanent Teeth.

The permanent central incisors appear at one and a half years, and are at full height at two years (Fig. 8).

The permanent inner-middle incisors appear at two and a half years, and are at full height at three years (Fig. 9).

The permanent outer-middle incisors appear at three and a half years, and are at full height at four years (Fig. 11).

The permanent corner incisors appear at four and a half years, and are at full height at five years (Fig. 12).

The permanent central incisor first shows signs of a neck at six years (Fig. 13).

The permanent inner-middle incisor first shows signs of a neck at seven years.

The permanent outer-middle incisor first shows signs of a neck at eight years (Fig. 14).

The permanent corner incisor first shows signs of a neck at nine years.

All the permanent incisors have fallen out or are represented by stumps at fifteen years.

The temporary or milk incisors are smaller, whiter, farther apart, and *not so loose* in the jaw as the permanent incisors.

MOLAR TEETH.

Three temporary molars appear in each jaw within the first month after birth.

The fourth molar (first permanent) appears in each jaw about six months after birth.

The fifth molar (second permanent) appears in each jaw about fifteen months after birth.

The sixth molar (third permanent) appears in each jaw about twenty-two to twenty-four months after birth.

The three temporary molars are replaced by permanent teeth at about three years.

Other Changes which give an Idea of the Age.—*New-born calves* have soft hoofs with convex soles. The flesh is flabby, dirty red, water-logged, and poorly developed. So poorly developed is it in the hind-quarters that the fingers

easily penetrate the flesh. Large quantities of glycogen are present in the flesh till a few weeks after birth. The gums are red and level with the teeth. (The crowns of all the incisors are free in one month). The cord is grey, moist, and firmly adherent to the navel. The vessels in the cord are patent, and so are the umbilical arteries in the lateral ligaments of the bladder, and the umbilical veins leading to the liver.

Calves are not considered mature and fit for the table till two weeks after birth, and in Great Britain are usually excluded from the market if the cord is firmly adherent to the navel.

Changes in the Navel.—The umbilical cord becomes black and dry during the four or five days following birth, and falls off within fifteen days. The navel (if not suppurating) has healed within twenty-one days, and become retracted in thirty days.

Formation of the Horns.—A frontal ‘thickening’ of the skin can be felt by the end of the second week after birth, and seen by the end of the third. The ‘horn centre’ has formed by the seventh week, and is through the skin by the eighth. A movable ‘horn point’ appears at about three to four months, and becomes fixed by about the fifth or sixth month. After the third year cows develop an annual ring round the base of each horn, so that at five years there are two rings, at six years three rings, and so on.

Ossification Changes in Cattle.—The articular surfaces of young animals are rosy and bluish, but become white with the advance of years. Certain structures that during youth are cartilaginous become with increased age more or less ossified. These ossification changes appear with great regularity in all cattle; so regular are they that by their presence one is able to make an approximate guess at the age of the animal whose carcass is being examined.

Up to three years old the ischio-pubic symphysis is cartilaginous, and can be cut through with a knife, but after three years it becomes osseous.

Up to four years old the costal cartilage of the ninth rib

can be cut through easily with a knife ; at five years this is difficult, and at six years almost impossible.

Up to six years old the junction is cartilaginous between the summits of the superior spines of the dorsal vertebræ and the rest of the spines (Bunge). This junction is marked by a red line as late as twelve years, when all trace disappears.

With increase of years the intervertebral discs become thinner, and the bodies of the vertebræ denser and harder.

RECOGNITION OF THE SEX OF BEEF CARCASSES.

Bull Carcasses in slaughterhouses are usually seen only between the age of six months and four years. They are characterized by the great muscular development about the neck, shoulders, and hind-quarters, the dark red colour of the flesh, and the scarcity of fat.

The penis is on the left half of the carcase, or, if removed, a furrow remains. The inguinal canal is open, as the testicles and cord were removed after slaughter (whilst in the ox the canal is hidden by the mass of 'scrotal fat'). The retractor penis muscle is well developed, and the erector penis muscle very prominent. The anterior part of the ischio-pubic symphysis shows a well-developed tubercle. The line of the symphysis is markedly concave, and forms posteriorly an acute angle with the line of adipose tissue on the inner aspect of the thigh, leaving exposed a triangular-shaped piece of the gracilis muscle. (In female carcasses this exposed piece of flesh is semicircular or bean-shaped.) The posterior surface of the dressed carcase shows a well-developed panniculus muscle, which has been described as resembling the head of Napoleon ; this is, however, as well marked in the bullock as in the bull.

The bones and the joints are much larger than in female carcasses.

The flesh is dark red, tough, stringy, dry, and coarse-grained, with very little fat. It has a peculiar odour, which is characteristic when once it has been recognized.

Carcase of the Ox.—This is usually met with in the slaughterhouse between the age of one and a half to six years. The muscles of the neck, shoulders, and hind-quarters, are not so well developed as in the bull; as a result the hind-quarters are less rotund. The penis itself and the retractor penis muscle are less developed, whilst the erector penis muscle is atrophied almost to absence. As in the bull, the angle formed by the meeting of the line of the ischio-pubic symphysis and the adipose tissue of the thigh exposes a triangular-shaped area of the gracilis muscle. The ox carcase has a well-developed layer of subcutaneous fat, which forms a prominent nodulated mass ('scrotal fat') completely hiding the inguinal canal.

The tubercle on the anterior part of the ischio-pubic symphysis is not so well developed as in the bull.

The flesh in young oxen of nine to fifteen months old is light red, firm, and elastic, and has a fair proportion of fat. In adult oxen the flesh is of a florid or light red hue. Immediately after slaughter the flesh is flabby and brownish in colour, but after a short exposure to the air it becomes fairly dry, elastic, and of a brick-red colour. Rigor mortis occurs in less than twelve hours, and should be marked. An opinion on the flesh should not be given till rigor mortis has occurred.

Ox flesh usually has a marbled appearance from fat in the connective tissue around the muscular bundles; this is absent in the limbs, and most marked in the longissimus dorsi muscle of the back. On cross-section the flesh is finely grained as a whole, but somewhat coarse in the neck and sternum.

The flesh of fattened heifers and young cows is very similar to that of oxen. Old oxen fattened shortly before slaughter have a darker, firmer, and tougher flesh, with no fat marbling, but fat is deposited under the skin, round the kidneys, and in the omentum and mesenteries. In fat oxen the flesh itself constitutes about 40 per cent. of the body weight, and the bones about 7 per cent.; in poor oxen, 50 per cent. and 12 per cent. respectively.

Carcase of the Cow.—Both the subcutaneous layer of fat and the muscles of the neck, shoulders, and hind-quarters, are poorly developed, with the result that the hind-quarters are not so rotund as in the bull and ox, that the posterior line of the hind-quarters is concave, and that the angles of the haunch are prominent. The posterior portion of the udder is sometimes left to resemble the ‘scrotal’ fat of the ox, but the presence of the mammary tissue and the supramammary lymphatic glands should expose such deception.

If removed entirely, the udder leaves a triangular mark (the dug), with its apex forward, extending from the inguinal region well forward on the abdomen. If not removed, the udder is large and flabby in cows, and has large teats. In the heifer it is smaller, infiltrated with fat, white in colour, and surrounded by a layer of fat. The fat at the base of the udder is often well developed, and the supramammary lymphatic glands are large.

The pelvis of the female is broader than that of the male, and the tubercle on the anterior part of the ischio-pubic symphysis is poorly developed. The floor of the pelvis is less curved than in the male, and the layer of fat on the inside of the thigh ends in a margin concentric with the line of the symphysis, exposing a semicircular or bean-shaped area of the gracilis muscle, and not a triangular patch as in the male.

The flesh of young cows is similar to that of oxen, but with increasing years it becomes darker and more stringy. If killed whilst ‘in milk,’ the flesh is often light-coloured and firm, with small quantities of fat. According to Baranski, there is also a slight odour of milk or cow dung. If the fat is exceptionally developed, it will be found under the skin and round the kidneys.

For convenience of comparison, the main characters of distinction between the carcasses of oxen, bulls, and cows, may here be arranged in tabular form :

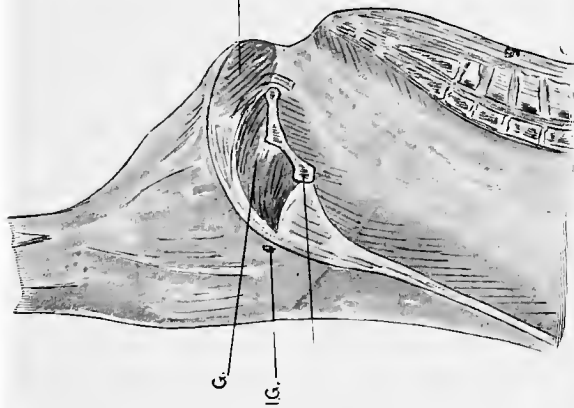


FIG. 15.—BULL.

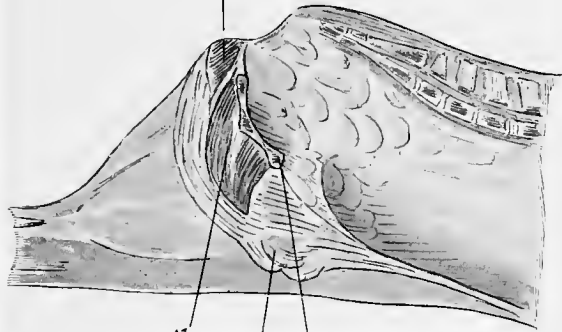


FIG. 16.—OX.

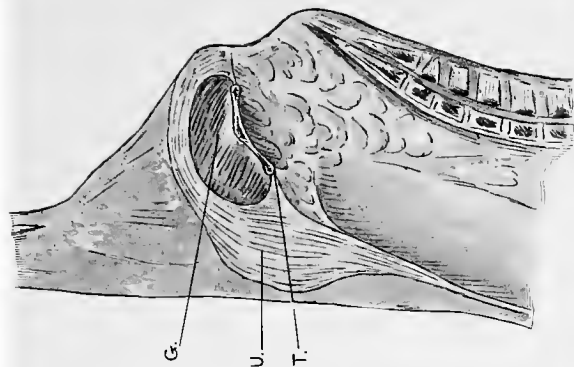


FIG. 17.—COW

A HIND-QUARTER OF THE BULL, THE OX, AND THE COW, SHOWING THE DIFFERENCES.

Bull.

G, The triangular area of gracilis muscle.
IG, The patent inguinal canal.
T, The well-developed tubercle.
EP, The large erector penis muscle.

Ox.

G, The triangular area of gracilis muscle.
S, The 'scrotal fat.'
T, The slightly-developed tubercle.
EP, The small erector penis muscle.

Cow.

G, The bean-shaped area of gracilis muscle.
U, The udder.
T, The poorly-developed tubercle.

COMPARISON OF BULL, OX, AND COW CARCASSES.

<i>Bull Carcase (Fig. 15).</i>	<i>Ox Carcase (Fig. 16).</i>	<i>Cow Carcase (Fig. 17).</i>
1. Ischio-pubic symphysis forms an acute angle with line of adipose tissue of the thigh, leaving a triangle of flesh exposed.	Similar to bull.	Margin of adipose tissue of thigh is concentric with line of ischio-pubic symphysis, exposing a bean-shaped area of flesh.
2. Great muscular development about the neck, shoulders and hind-quarters.	Fair development.	Slight development.
3. Flesh dark red, coarse-grained, and little fat.	Flesh light red, fine grained, and marbled with fat.	Similar to ox.
4. Penis or its furrow on left half of carcase.	Similar to bull.	Absent.
5. Well-developed retractor penis and erector penis muscles.	Retractor penis small, erector penis almost absent.	Absent.
6. Open inguinal canal and little 'scrotal' fat.	Large mass of 'scrotal' fat hiding entrance of inguinal canal.	Udder, or the triangular space it occupied.
7. Well-developed tubercle at anterior part of ischio-pubic symphysis.	Slightly developed.	Slightly developed.
8. Bones and joints well developed.	Fairly developed.	Slightly developed.
9. Characteristic pungent odour of the flesh.	None.	Slight odour of milk from the flesh.

Beef Fat (tallow) is firm and slightly greasy, with a peculiar odour of its own and a suety taste. It varies in colour from white to yellow or straw colour, being whiter in young bulls and animals fed on corn or grass than in bullocks or cows, or animals fed on rich cakes. The yellow colour, however, is constant in the Jersey and Guernsey breeds, however fed. With the advance of years the fat loses its firmness and becomes soft. According to Schulze, beef fat melts between 41° to 50° C. In the process of cooking,

yellow fat loses from 20 per cent. to 30 per cent. of its weight, and is therefore to be avoided in large consignments.

The subcutaneous **Connective Tissue** in beef carcasses should be just moist (but with no draining of fluid from its meshes). It should glisten on exposure, and be most abundant in the flanks, shoulders, abdomen, and brisket—*i.e.*, wherever the skin is loose.

Veal.—Calves are seldom killed for meat before five weeks old, and never should be slaughtered before two weeks old. The flesh should be a pale red colour, with a fine grain but tough fibres. It is never very firm, but the consistence varies with the age and the degree of fatness. It has a distinctive odour. If fattened on milk the flesh is pale, and sometimes almost white. There is little or no marbling with fat. Calves are now usually bled at the time of slaughter; if not, the flesh is of a darker colour. The fat is first reddish, then becomes white and tallow-like. It is softer than beef fat.

Calf flesh is usually hung in its skin to prevent drying, but soon sours, and if hung too long gives off then an acid odour.

Slink Veal (that of newly-born or unborn calves) is light-coloured, soft, and watery. The fat is gelatinous in appearance. The muscles of the hind-quarters are poorly developed, and friable under finger pressure. Rigor mortis is almost absent. The lungs of unborn or stillborn calves are collapsed, and sink in water.

It is interesting to note that the carcase of a large dog, after the head and feet have been removed, resembles that of a young calf. A dog carcase has smaller joints, and usually a canine odour. The fat is white and oily, with a characteristic odour, and melts at 22.5° C. There are, however, such marked differences between the bones of the two animals that detection of attempted fraud should be simple.

Veal is a frequent substitute for chicken in the manufacture of ham, chicken and tongue paste. In fat calves the flesh itself constitutes about 45 per cent. of the body weight.

Carcases of Sheep.

Some of the commoner names applied to sheep in different parts of the country may be of interest, and are here given :

Males.—A tup lamb includes any male from birth until weaned (two to three months old).

Tup-hogg (uncastrated) and wether hogg or tegg (castrated) are applied to males between weaning and first shearing (end of May).

Shearling tup (uncastrated) and shearling wether (castrated) are applied to males between first and second shearing.

A tup, ram, or buck, is an uncastrated male after second shearing.

A wether is a castrated male after second shearing.

Females.—A ewe lamb includes any female from birth until weaned (two to three months old).

A ewe hogg is applied to females between weaning and first shearing.

A gimmer or threave is a female between first and second shearing.

A ewe is any female after having had a lamb (*i.e.*, usually over one and a half years old).

Dentition of Sheep.—As is the case with cattle, examination of the teeth gives a very approximate idea of the age. Sheep also have no canine teeth, and no incisors in the upper jaw. The normal number of teeth in sheep is expressed by the following formula :

	<i>Incisors.</i>	<i>Canines.</i>	<i>Molars.</i>
Temporary or milk teeth...	$\frac{0-0}{4-4}$	$\frac{0-0}{0-0}$	$\frac{3-3}{3-3} = 20.$
Permanent teeth ...	$\frac{0-0}{4-4}$	$\frac{0-0}{0-0}$	$\frac{6-6}{6-6} = 32.$

The following lists give the number of teeth that should be present, and the changes that occur in them at various ages :

INCISOR TEETH.

Temporary or Milk Teeth.

- Two temporary incisors (the two central) are through the gums at birth.
- The inner-middle temporary incisors appear within the second week after birth (eight to fourteen days).
- The outer-middle temporary incisors appear within the third week after birth (fourteen to twenty-one days).
- The corner temporary incisors appear within the fourth week after birth (twenty-one to twenty-eight days).

Permanent Teeth.

- The permanent central incisors appear through the gums at one to one and a quarter years.
- The permanent inner-middle incisors appear through the gums at one and a half to two years.
- The permanent outer-middle incisors appear through the gums at two and a quarter to two and three-quarter years.
- The permanent corner incisors appear through the gums at three to three and a half years.
- The two permanent central incisors form a notch with their cutting edges at six years, and fall out at about ten years.

MOLAR TEETH.

- Three temporary molars appear in each jaw within the first month after birth.
- The fourth molar (first permanent) appears in each jaw at about three months.
- The fifth molar (second permanent) appears in each jaw at about nine months.
- The sixth molar (third permanent) appears in each jaw at about eighteen months.
- The three temporary molars are replaced by permanent teeth at about two years.

The Carcase of the Ram.—This is characterized by the muscular development about the neck and shoulders, and by the presence of the penis, which always remains on the left half of the carcase. A disagreeable and characteristic odour may be present.

The Carcase of the Ewe has less muscular development about the shoulders and the neck than the ram, and the udder is always left in position.

The Flesh of Sheep (mutton or lamb) is of a light red or brick red colour, of a less florid hue than in beef. It is moderately firm, of finer grain than beef, and seldom marbled with fat, except the longissimus dorsi muscle. Old breeding animals have a dark, tough flesh, with little subcutaneous fat, and the flesh of bucks frequently gives off a rank characteristic odour. There is a marked contrast between the flesh of young animals and that of old ewes or wethers, the latter approaching the appearance of beef.

A flavour of wool in the meat arises from leaving the skin attached to the carcase for some time after slaughter, or from wrapping the carcase up in the skin. Leaving the abdominal viscera too long in the abdomen is also said to produce a woolly flavour in the meat. In fat sheep the flesh itself constitutes about 30 per cent. of the body weight.

Mutton Fat (suet) is odourless, firm, brittle, and of a beautiful white colour. It is evenly distributed over the back and sides of the carcase, and is plentiful round the kidneys. It melts between 31° to 52° C.

Owing to the smaller business risk, and to the fact that a sheep puts on nearly twice as much flesh in its first year as in its second, it is customary in England and America to bring yearlings by forced feeding into a fit condition for slaughter.

The Flesh of Goats has a characteristic goaty odour which becomes more marked on heating the flesh. The carcase of a goat shows a scarcity of subcutaneous fat. The subcutis is somewhat sticky, so that recognizable hairs from the goat's skin are often found adherent to it. The flesh

is darker and coarser than that of sheep, is not marbled with fat, and there is less fat on the surface of the carcass than in sheep, although the fat round the kidneys is as plentiful. Goat fat is very similar in appearance to that of sheep. The substitution of goat flesh for sheep flesh is not important to detect, from a sanitary point of view.

There should, however, not be much difficulty in recognizing the two carcasses, and the points of difference may here be given :

COMPARISON OF GOAT AND SHEEP CARCASSES.

<i>Goat.</i>	<i>Sheep.</i>
<p>The flesh is dark, coarse, and not marbled with fat.</p> <p>The subcutis has little fat, and is sticky, frequently with goat hairs adherent.</p> <p>Distinctive odour.</p> <p>The carcass is long in the flank, has a sharp back and sloping croup.</p> <p>The thorax is flattened laterally.</p> <p>The bones are longer and more slender than those of sheep.</p> <p>The pelvis is smaller than that of sheep.</p> <p>The cervical spines are long, pointed, and sharp-edged.</p> <p>The lateral edges of the sacrum are thin and sharp.</p> <p>The spine of the scapula is flat and straight.</p>	<p>The flesh is light red, fine-grained, and marbled with fat.</p> <p>The subcutis is well supplied with fat.</p> <p>Distinctive odour.</p> <p>The carcass is short in the flank, the back is rounded, and the croup rotund and fleshy.</p> <p>The thorax is barrel-shaped.</p> <p>The cervical spines are broad and blunt.</p> <p>The lateral edges of the sacrum are thickened and blunt.</p> <p>The spine of the scapula is broad, and has a tubercle in its middle, directed backwards.</p>

Weight.—The difference in weight of the various breeds of sheep is very great, but, speaking generally, a full-grown sheep should weigh from 60 to 90 pounds.

Carcasses of Pigs.

The names given to pigs are fewer in number than those for other food animals, and are more constant throughout the country.

Newly-born pigs are referred to as squeakers, suckers, or porkers, whatever their sex.

Males.—A boar or brawn is an uncastrated pig.

A hogg or shott is applied to a pig that was castrated without having been used for service.

A bawner is one that was castrated after being used for service.

Females.—A sow is a female of any age after she has farrowed.

A gilt or gelt is an uncastrated female that has never farrowed.

A cut sow or spayed pig is a castrated female.

Dentition.—As is the case with the other food animals, a very approximate guess at the age can be made after examination of the teeth. In the case of pigs, however, the teeth come up in no order according to their arrangement in the mouth, and thus make the recognition of the age complicated and difficult. The following arrangement will, however, put the changes as concisely and clearly as possible. The dental formula and table of changes for the pig are as follows :

	<i>Incisors.</i>	<i>Tushes.</i>	<i>Premolars.</i>	<i>Molars.</i>
Temporary or milk teeth...	$\frac{3-3}{3-3}$	$\frac{1-1}{1-1}$	$\frac{0-0}{0-0}$	$\frac{3-3}{3-3}=28.$
Permanent teeth ...	$\frac{3-3}{3-3}$	$\frac{1-1}{1-1}$	$\frac{1-1}{1-1}$	$\frac{6-6}{6-6}=44.$

TEMPORARY TEETH.

<i>Age.</i>	<i>Incisors.</i>	<i>Tushes.</i>	<i>Pre-molars.</i>	<i>Molars.</i>
At birth.	Corners are cut.	Are cut.	—	—
1 month.	Centrals are cut.	—	—	2nd and 3rd are through; 1st just appearing.
2 months.	Centrals are in wear; laterals just showing.	—	—	1st, 2nd and 3rd are level.
3 months.	All temporary teeth are now fully developed— <i>i.e.</i> , 28.			

PERMANENT TEETH.

<i>Age.</i>	<i>Incisors.</i>	<i>Tushes.</i>	<i>Molars.</i>
5 months.	—	—	Premolar is cut; 4th molar showing close to angle of jaw (well up at 6 months).
9 months.	Corners replaced and well up.	Just showing; temporary out.	—
1 year.	Centrals coming through.	—	5th molar well up.
15 months.	—	—	1st, 2nd and 3rd milk replaced, but not worn.
18 months.	Laterals coming through.	—	6th molar cut.
2 years.	All level and worn.	—	6th molar free from angle of jaw.

The **Flesh of Pigs** is pale red or rose-coloured, often streaked with white. It is finely grained, and both infiltrated and surrounded with fat. It is paler in young than in older animals, but even in adults is lighter in colour than, and not so firm as, the flesh of oxen or sheep. There is always a characteristic odour, which in old boars is very pronounced and suggestive of urine. The odour is more marked after cooking.

Streaked bacon, or bacon with alternating layers of fat and flesh, is said to be obtained by alternately starving and overfeeding the pigs.

As a rule pigs are not skinned, but large boars occasionally are, and in them the flesh is firm, dark, poor in fat, and might be mistaken for the carcase of a ram.

The best and firmest pig's meat is obtained by feeding on milk, barley or maize, and potatoes. Bran and brewers' grains both make a soft, spongy meat with a disagreeable odour, whilst peas and other legumes give it a bitter taste. Excess of oats and beans in the food, or constant feeding on swill makes a soft, oily bacon with a disagreeable taste.

Pig Fat (lard) depends very largely for its appearance on the particular kind of food on which the pig has been fed.

The fat is usually white, soft, and greasy, but may be yellow if the pig was corn-fed, or rank-smelling and grey if fish-fed. There is a thick layer of fat under the skin and round the kidneys. Pig fat melts at 42.5° to 48° C.

Weight.—The carcase of a full-grown pig should weigh from 100 to 180 pounds.

Horseflesh.

The Flesh of the Horse is darker and coarser-fibred than beef, and has a less pleasant odour. (The flesh of mules and asses is not so coarse as that of horses.) It rapidly darkens in colour on exposure to the air, and soon becomes almost black, with a bluish sheen. After a few days it develops a peculiar sickly odour, and becomes sticky to the touch. On cooking, or the addition of sulphuric acid to the flesh, a characteristic odour likened to that of a horse stable is given off. During cooking, conspicuous oily globules appear on the surface of the meat juice. Horseflesh is characterized by the presence of glycogen, which gives it a sweetish taste. The amount of glycogen present varies between 0.9 to 2 per cent. by weight of the meat analyzed, whilst in pigs it is rarely more than 0.3 per cent., and in cattle and sheep it is usually absent. According to Niebel, if meat contains over 1 per cent. glycogen in dry fat-free samples, it is horseflesh (Ostertag). The meat of foetuses and fasting calves often has as large a percentage of glycogen as that of the horse.

Horse Fat.—Under the skin and round the kidneys the fat is of a bright golden-yellow colour, but the mesenteric fat is a brownish-yellow. Horse fat, owing to the amount of olein present, is soft and oily, and has a sickly, unpleasant taste. It melts at 30° C. The fat of the bone marrow is in colour waxy yellow, and hardens on exposure to the air, developing at the same time a greenish sheen. It melts at 65° C. 'Rendered' horse grease is white.

According to Niebel, the amount of glycogen present in horse meat is much larger in well-fed horses at rest than in

poorly-fed or overworked horses. The same authority also states that roasting, pickling, or smoking, horse meat does not reduce the quantity of glycogen present, but that if the horse meat be kept for some time it will be found to have lost much of its glycogen.

The presence of horse meat in sausages cannot be detected when mixed with other kinds of meat, and it should be remembered that the flesh of foetuses and fasting calves contains large quantities of glycogen. These latter, however, make sausages of a light grey colour, whilst sausages made from horseflesh are dark brown. Sausages made from beef or pork contain no glycogen.

For the detection of glycogen in meat there are several tests worthy of mention. Probably the most satisfactory is that of Bräutigam and Edelmann, but Kulz's method and Courtoy and Coreman's modified test deserve some attention.

Bräutigam and Edelmann's Test for Glycogen in Meat.

1. Boil 50 grammes of the meat in 200 grammes of water for one hour.

2. Add $1\frac{1}{2}$ grammes of caustic potash dissolved in 200 grammes of water, and continue heating until the meat is entirely disintegrated.

3. Cool and evaporate this broth down to 100 grammes, and then filter.

4. Add nitric acid to decolorize the broth and precipitate the proteids; again filter.

5. On to a sample of this broth in a test-tube pour a *hot* saturated solution of iodine; if glycogen is present, a blue-red or purple ring forms at the line of contact of these two liquids. The colour ring forms immediately, varying in extent and density in proportion to the amount of glycogen present.

Starch, however, gives a similar reaction, and for this reason, to make the test more reliable, Bräutigam and

Edelmann suggest the following alterations in the above test, by which the starch is removed :

1. The sample of broth and meat obtained after Stage 2 in the original test is heated for several hours over a water-bath to extract the glycogen.

2. Filter this broth, and evaporate it down to one-eighth its volume.

3. Add double the volume of concentrated acetic acid. In about half an hour clots have formed and sunk as a precipitate, leaving the overlying liquid free from starch. Filter.

4. Test the filtrate with iodine for the presence of starch, and, if still present, add more acetic acid and leave for a short time.

5. When free from starch, add the *hot* saturated iodine solution, and if glycogen is present, the violet ring reaction will be obtained.

Kulz's Test.

1. Boil 50 grammes of the meat, 2 grammes of caustic potash, and 200 grammes of water, for six to eight hours, until the meat is disintegrated.

2. Filter and evaporate the filtrate to one-half its volume.

3. Cool the filtrate, and precipitate the nitrogenous substances present by the alternate addition of mercuric iodide and hydrochloric acid. This should leave a clear fluid, opalescent from the presence of glycogen.

4. Dilute the filtrate with $2\frac{1}{2}$ volumes of 90 per cent. alcohol, which precipitates the glycogen.

5. Filter and wash the precipitate by running through it in succession 60 per cent., 90 per cent., and absolute alcohol.

6. Dissolve the precipitate in water, and test with iodine as above. Instead of testing the precipitate, which is pure glycogen, it may be dried at 110° C. and weighed, thus indicating the amount of glycogen present in the 50 grammes of meat.

Courtoy and Coreman suggest the following modification of Bräutigam and Edelmann's test, and with it get very similar results :

1. Boil 50 grammes of finely minced fresh meat for fifteen minutes, and filter.

2. To a small quantity of the filtrate in a test-tube add a solution of iodine (iodine, 2 parts ; potassium iodide, 4 parts ; water, 100 parts).

From the reaction that follows they make the following deductions :

- (a) If the filtrate becomes dark brown in colour, and this colour disappears on heating to 80° C., but reappears on cooling, horse meat is present.

- (b) If the filtrate does not become dark brown in colour, no horse meat is present.

- (c) If the filtrate gives a blue colour reaction, starch is present. In this case the starch has to be precipitated by adding two or three volumes of concentrated acetic acid, the liquid is then filtered, and the filtrate retested as before.

CHAPTER III

Preserved meat: General—Preserving by cold—Simple cold store—Chilling meat—Freezing meat—Keeping meat on ice—Cold—storage. Chemically preserved: Salting—Pickling—Salicylates—Sulphurous acid and Boric acid. Preserving by heat (canned)—Smoked meat.

Preserved Meat.

THE 'keeping power' of meat depends on the condition of the animal at the time of slaughter, and on the temperature and moisture of the air in which it is kept. Meat of animals slaughtered for disease has a very poor 'keeping quality,' no matter in what temperature and degree of dryness it is kept.

Putrefactive organisms thrive best on moist, warm media, so that meat will obviously keep better in dry and cold than in moist and warm rooms. For the same reason careful cooling immediately after slaughter is essential for good 'keeping powers,' as at the time of slaughter the meat is both warm and moist. Another advantage of cold storage is that newly-killed meat is tough and unpalatable, but becomes tender on keeping, owing to the formation of sarcolactic acid in its tissues. In hot weather meat cannot without cold storage be kept a sufficient length of time to become really tender.

A household method of rendering meat tender is sprinkling vinegar, whey, or wine, on the meat and then pounding it. This makes it unnecessary to keep the meat so long.

Cold storage, by preserving the meat, reduces the waste in a butcher's shop, for the meat can be brought from the cold store as required. It must be remembered, however,

that meat which has undergone cold storage soon decomposes on exposure to warm temperatures.

For a cold store to be effective, the atmosphere must be dry and the ice pure. Micro-organisms will grow in cold, damp places. Natural ice collected from ditches, ponds, etc., is dangerous, and ptomaine-poisoning has been traced to eating fish kept on such ice, owing to the fish having putrefied. It should also be borne in mind that the bacillus of enteric fever is not destroyed in water at freezing-point.

Preserving Meat by Cold.

This is the best method of preserving meat, as it affects disadvantageously neither the taste nor the nutritive value, while it improves the quality, enabling the prolonged action of the sarcolactic acid to render the meat tender and juicy.

The Effect on Putrefactive Bacteria.—These are highly resistant to cold, since even six hours' exposure to a temperature of -70° C. will not destroy them. On warming frozen meat, putrefaction appears in a few hours. A low temperature, however, inhibits or temporarily prevents their multiplication and growth, thus retarding decomposition (Coleman and McKendrick).

Pathogenic bacteria are equally unaffected by cold, whilst cysticerci die after exposure to a temperature of -45° to -49° C., and trichinæ after exposure to -60° or -70° C.

Yeasts, moulds, and bacteria, according to Havemann, thrive on meat and in milk at a temperature of 7° C.—the usual temperature in good cellars and ice-chests.

A simple cold store, and one that could be adopted in any butcher's shop, consists of two rooms of unequal size (one at a higher level than the other), with walls that are double and hollow, and without any woodwork. The latter condition is essential, as the wood becomes damp and may harbour organisms. The larger room is used for the ice, and should be at a higher level than the smaller room containing the meat. All air entering the lower meat room passes first through

the upper ice chamber, and then passes out of the lower room near the ceiling. The ice used should be pure, although probably the current of air is too sluggish to carry organisms from the ice into the meat room. The sluggish current, however, has this disadvantage, that the air of the meat room becomes damp.

Meat may be (1) only chilled, or (2) completely frozen.

Chilled Meat.—The usual method for importation is to envelop the meat in thin canvas coverings and suspend it in refrigerating chambers through which air, a few degrees above freezing-point, is forced. Most of the meat imported to this country in this condition comes from North America, as the method of preservation is not satisfactory for longer periods than two to three weeks. This meat soon putrefies on exposure to warm temperatures.

The surface of the carcase thus chilled is cold, stiff, and moist, the flesh bright red, and the fat and gristle are pink. The tissues are less altered than when the meat is actually frozen.

Frozen Meat.—On account of the distance, it is in this condition that meat is imported to Great Britain from Australia, New Zealand, and South America; but for shorter distances and inland trade it is better simply to cool the meat down to 3° to 5° C. Meat keeps indefinitely while frozen, but soon putrefies after it has been allowed to thaw. Meat loses weight whilst actually in the frozen condition, and again when thawed, through bursting of the cells and the escape of the contained fluid. Mutton freezes more quickly than beef.

After a month's freezing, the surface of the carcase shows as a rule a greyish-white deposit of excreted meat salts. After thawing, the flesh is usually diffusely red or pink, owing to the hæmoglobin being dissolved in the fluids and permeating the adjacent tissues. This diffuse coloration is most marked if the thawing has been rapid.

When frozen and thawed several times, small patches of the flesh become pale in colour and gelatinous in appearance. Whilst thawing proceeds, moisture oozes from the

surface ; after some time, however, the surface appears dry and dirty, but the deeper layers remain moist.

Cooling Meat by Means of Ice is simple, cheap, and suitable for householders, retail dealers, and small slaughter-houses. The loss of weight through 'cooling' is for the first few days no greater than under ordinary circumstances. There are two methods in common use :

1. The meat, etc., is placed on, and in direct contact with, the ice. This method is unsatisfactory, as only one side is really cooled, and the meat, instead of being kept dry, is kept moist.

2. The better method is the indirect one : (a) The meat is placed in a room supplied with air which comes through another room containing the ice ; the meat is thus kept dry. (b) The ice is placed between double walls in the middle of the cooling room.

Brainard's Method is to place the ice on a corrugated metal sheet that forms the ceiling of the cooling room, thereby insuring dryness of the air, which is not moistened by contact with the ice.

Wittenbrink's Cooling Plant is similar to the cold store already described. It consists of three successive rooms. (1) An ice room, (2) a cooling room, (3) a room connecting the cooling room with the outer air.

The ice room is at a higher level than the cooling room, and separated from it by a dividing wall which, by means of slits that can be closed if desired, permits air to pass through near the ceiling. The cold air thus descends to the floor of the cooling room, both cooling and drying the meat which is hanging from the beams. Through ventilators situated near the ceiling the warmer air escapes from the cooling room. The meat and the walls of the room are by this method always kept dry. The cooling room is opened for one hour morning and evening during business hours.

It is essential for a good storage room—

1. That the internal walls and floors be smooth, non-porous, and easily cleaned.

2. That the light be good, and only pure air admitted. A good light enables one to observe collections of dust and filth which might otherwise be overlooked. Insistence on a supply of pure air is necessary to avoid any risk of contamination from neighbouring manure-heaps, stables, etc. Meat also absorbs odours, such as that of tar, paint, etc., and thus acquires an unpleasant flavour.

3. That the storage room be easily accessible from 'unloading' places.

In order to keep the air of a cooling room dry, it is advisable to cool freshly-slaughtered meat in preliminary cooling rooms before putting it into the cold storage room.

Chemically Preserved Meat.

This includes not only salting and pickling, but the addition of antiseptics, such as boric acid, salicylates, and sulphurous acid.

Salting and Pickling of Meat.—This process of preservation is used mostly for beef, ham, and bacon sides. Meat is said to be 'salted' when dry salt has been rubbed into it, and 'pickled' when salt brine has been used. Common salt in itself is only slightly disinfectant, so that, while it prevents putrefactive organisms from multiplying, it will not render diseased meat wholesome, nor will it destroy pathogenic organisms under some months' immersion in a saturated solution of the salt. Salting or pickling the meat of diseased animals is therefore dangerous and deceptive. As flesh preserved in salt alone loses its colour, to prevent this it is customary to add saltpetre to the salt brine.

Brine as commonly used consists of—Common salt, 250 parts; saltpetre, $2\frac{1}{2}$ parts; cane-sugar, 20 parts; water, 1,000 parts.

The cane-sugar is added to help in checking putrefaction. It occasionally causes a slimy fermentation scum to form on the brine, but this does not affect the pickling powers of the brine nor spoil the result.

The ordinary method of 'pickling' is to soak the meat in brine for six to nine weeks. This method may be hastened by injecting the brine deep into the meat by means of special syringes, thus uniformly and more quickly impregnating the meat. A still quicker and more uniformly effective method is the pickling of meat under reduced pressure, by exhausting the air from the brine-tank after the meat has been placed in the brine. It is said that hams may by this method be 'cured' in fourteen days. Madagascar was the first country to attempt the 'pickling' of carcasses by the aid of their circulatory systems. The animal is killed, and in the case of the pig the hair is removed by scalding or scraping. The thorax is then opened, and the *right* side of the heart cut open. A canula is forced through the aortic wall into the lumen of the vessel, and salt brine pumped through the tissues. The residual blood is thus forced out of the opened right side of the heart, and is replaced in the blood system by the brine. The process takes four or five minutes, and the carcass is then cut up, allowed to cool, and is ready for exporting.

The 'dry-pickled' beef and tongue that is imported into this country from America is pickled in brine, then dried and sprinkled with borax.

'Pickled' meat is of a lighter colour than fresh meat. It has a salt taste, and is alkaline in reaction. The cut surface is smooth, and not jagged, as is fresh meat.

'Pickled' meat, according to Nothwang and Polenske, should be classed as an inferior meat, because the process diminishes the extractives, reduces the phosphates 30 to 50 per cent., and the nitrogenous compounds 7 to 10 per cent.

The amount of saltpetre obtainable from pickled meat is so small (0.33 gramme per cent.) that very large quantities of pickled meat may be eaten before any harm results. It requires the ingestion of 5 or 6 grammes of saltpetre to cause illness in the consumer, and 8 to 9 grammes to cause death (Nothwang).

Salted or pickled meat always requires careful inspec-

tion, for in improperly cured meat subsequent decomposition soon occurs, as shown by the moist, slimy, and mouldy surface. A steel skewer may be inserted into the deeper layers of suspicious meat, and on withdrawal smelt for putrefactive odour. If suspicion of decomposition is aroused, cut into the deeper layers, the changes being most marked near the bone. It must not be forgotten that meat preserved in this manner may have been 'bad' before it was 'cured.'

Although it is not usually difficult to distinguish salted meat from fresh meat, in doubtful cases reliance can be placed on the different reaction given with a solution of silver nitrate. For this purpose, Ostertag recommends the use of a 1 per cent. solution of silver nitrate; a few drops of this solution are allowed to fall on the freshly cut surface of the meat. In the case of salted or pickled meat, a milk-white cloudiness is produced (silver chloride), which rapidly becomes brown-black on exposure to the air. To make this test, carefully wash in distilled water the meat to be examined, and dry the surface with a clean cloth; then make a rapid cut through the meat, and drop the solution of silver nitrate on to this freshly cut surface. In the case of fresh meat, the merest trace of a milky reaction is produced.

Preservation of Meat with Boric Acid.—Boric acid or its salt, borax, are both used for this purpose, either in solution or as a powder. This method of preservation is common in Russia and America for both meat and fish. Man for a while can, without injury, ingest 2 to 4 grammes of boric acid daily; but continued large doses of the drug cause inflammation of the kidneys. For this reason, any meat preserved in this manner should be seized as unfit for human consumption.

To detect Boric Acid in Meat.—1. The Swiss Agricultural Department recommend mincing a piece of fatless meat, and shaking it in a test-tube with 20 to 30 c.c. of water to which a few drops of hydrochloric acid have been added. The solution is then boiled, and by this means some of the

boric acid or borax is dissolved, and its presence can be demonstrated with curcuma-paper. Curcuma-paper, dipped into a solution of boric acid and dried, becomes brownish-red on moistening with water, and bluish-black on moistening with ammonium hydrate.

2. Kämmerer recommends the saturation of 10 grammes of the suspected meat with a solution of caustic soda, and incinerating the mixture in a platinum dish. The dried mass is then neutralized with 10 per cent. sulphuric acid solution, and the solution tested with curcuma-paper.

3. The flame test consists in saturating 10 grammes of the suspected meat with a solution of caustic soda, and incinerating the mixture in a platinum dish. The dried mass is next neutralized with a 10 per cent. solution of sulphuric acid, and finally treated with 5 c.c. of concentrated sulphuric acid and 5 c.c. of methyl alcohol. The alcoholic solution is then lighted, and the presence of boric acid detected by the flame becoming emerald green in colour.

Preservation of Meat with Sulphurous Acid.—Sulphurous acid, in the form of the acid sulphite of soda, potassium, or calcium, is used for preserving minced meat, sausages, etc. As a result of the oxidation the odour of sulphurous acid soon disappears. This is hastened by cooking. Thirty to 40 c.c. of a saturated solution of calcium sulphite per 10 kilogrammes of raw minced beef is the proportion usually employed.

To detect Sulphurous Acid in Meat.—Kämmerer recommends the potassium iodate test. The suspected meat is placed on potassium iodate paper, and then moistened with a 12 per cent. solution of sulphuric acid (free from nitric acid). The smallest quantity of sulphurous acid in the meat causes at once a marked blue coloration of the paper. With this test, however, a slight blue colour will *always* appear *after a while*, even with unpreserved meat, particularly if it be not quite fresh. The test is useless for salted meat, on account of the hydrochloric acid liberated.

Microscopic examination of meat preserved by the addition of sulphurous acid in the form of sulphites reveals crystals

of the sulphate, which result from the oxidation of the sulphites.

All meat preserved in this manner should be condemned as unfit for human food.

Salicylic Acid also is used for preserving meat, particularly fish (salmon), and meat is occasionally preserved by the addition of **Ammonium Acetate**, all the taste and smell of which disappear during the process of cooking.

Preservation of Meat by Heat.

This method of preservation serves a very useful purpose if carried out properly. It is an erroneous idea, however, that unsound meat can be rendered fit for food by means of heat. To be a safe form of preservation, it is essential that sound meat be used, and that the subsequent packing be carried out aseptically; otherwise the sterilized meat becomes infected and undergoes decomposition.

In the process of 'tinning' or 'canning' meat, the tins are rapidly filled with boiled fresh meat cut up small and freed from bones and tendon. The lid is immediately soldered on to the tin by means of machinery, and the tin now undergoes its first inspection. If properly closed, the tin is passed into the sterilizer and subjected to 7 pounds pressure at 110° C. for one and a half hours, after which it is removed and examined for signs of leakage. Any flaws permitting leakage are repaired, the sound tins are punctured to let any enclosed air escape, and the hole is then soldered over. The tin is then again passed into the sterilizer for another one and a half hours, after which it is removed and allowed to cool. While cooling, it should be constantly 'turned,' in order to distribute the liquids throughout the tin, and to thus obtain a more uniform distribution of jelly. The tin is now run through hot lye to remove the grease, then through cold water, and is finally labelled.

'**Corned**' Beef (from America and Australia) is prepared in much the same way, the only difference being that the meat is first pickled in salt brine, and boiled before being

packed in the cans. Corned mutton and pork are prepared in a similar manner.

It is unfortunate for the reputation of 'canned meat' that the flesh of poor and diseased animals, sometimes partially decomposed, is at times used for filling the cans.

Inspection of Canned Meat.—That canned meat serves a useful purpose there is no doubt, but such food requires careful supervision, as the contents of 'unsound' cans are a not uncommon cause of meat-poisoning.

To carry out this supervision efficiently, the cans require to be inspected, palpated, percussed, and auscultated.

By inspection should be noticed 'bulging' ends of the can (suggesting distension with gas), imperfect seams, broken flanges, and evidence of faked or re-soldered perforations.

By palpation the inspector appreciates the amount of resistance, the extent of the 'blowing,' or the natural resiliency of the can.

By percussion a resonant note reveals the presence of air or gas, due either to an imperfectly filled tin ('slack') or to decomposing contents ('blown'). A dull note accompanied by bulging ends denotes overpacking.

By auscultation : The character of the sound heard on shaking a can near his ear informs the inspector whether the contents are dry or sloppy.

If still in doubt as to whether or not the tin is 'unsound,' puncture it under water; if 'blown,' bubbles of gas will escape, the bulging ends of the tin collapse, and the elasticity of the tin diminish. Further, the escaping gas has an offensive odour. To make more certain that the tin is unsound, it can be opened, thus exposing the partially liquefied gelatine, or even a slimy, discoloured, sloshy content, with blackened areas on the surface of the tin.

On opening a tin, the contents may be dry and crumbly, suggesting staleness of the meat before it was tinned. This, though safe to eat as soon as the tin is opened, soon undergoes changes and becomes dangerous.

Smoked Meat.

Wood smoke, usually from beech chips, juniper bushes, or hard wood generally, is commonly employed for preserving meat. The smoke from fir chips is to be avoided, as it gives an unpleasant flavour to the meat owing to the turpentine in the smoke. The smoke itself acts as a desiccant, and the volatile substances it contains as an antiseptic.

Long-continued 'smoking' is required to render fresh meat sterile, but salted meat, owing to its smaller water content, can in one week be sterilized by exposure to smoke.

Smoking, on account of its desiccating power, whilst it fails to destroy them, checks the growth of pathogenic organisms.

The method usually adopted for smoking meat is the so-called 'slow method,' the process extending over several days at a temperature of 25° C. (77° F.).

The 'rapid' or 'hot' method is used almost entirely for fish. The fish are subjected to several hours' exposure to smoke at a temperature of 70° C. (158° F.), and finally to an hour or so at a temperature of 100° C. (212° F.).

The practice of subjecting meat to smoke during the day, and discontinuing it during the night, has proved unsatisfactory.

CHAPTER IV

Physiological conditions which make meat unsound: Foetal flesh—Immature flesh—Poorness and emaciation—Abnormal odour—Defective bleeding—Advanced pregnancy. Effect of drugs on meat—Effect of food on meat—Phosphorescent meat—Moulds and fungi on meat—Artificial colouring of meat.

Physiological Conditions which render Meat unsound.

Foetal Flesh.—The flesh of the foetus is occasionally put on the market by unscrupulous butchers, either as normal veal or worked up in various preparations. Although not harmful, the idea of eating such flesh is repugnant, and, as the purchaser is usually unaware of the deception, such meat should be seized. In foetal carcasses the flesh is watery, flabby, and easily torn with finger pressure, particularly in the hind-quarters; it has also a very high glycogen content. In such carcasses the connective tissues are sodden and gelatinous, the urachus is patent, and the lungs, never having contained air, sink when placed in water. The stomach contains no curdled milk, and the intestines no milk fæces. The hoofs have untouched convex pads.

Immature Flesh.—Young pigs, lambs, and kids, are eaten when only a few days old, but calves are not considered fit for the table until about two weeks old. From eight to fourteen days after birth the muscular tissue is greyish-red, poorly developed, flabby, and water-logged, whilst the fat is tough and stringy. The stump of the umbilical cord falls from the navel about eight to twelve days after birth. Such carcasses should not be permitted entry into the market, for, although harmless (that they cause diarrhoea is probably untrue), they are repugnant.

Poorness and Emaciation.—The distinction between 'poor-ness' and 'emaciation' is hard to define. Some carcasses are naturally *poor*, although during life the animal enjoyed good health. Such carcasses are quite fit for human food, for, though insipid and tough after cooking, the flesh has a high protein content and is very nutritious. *Emaciated* carcasses, on the other hand, should be seized, being unfit for food, owing to the cause of emaciation—*i.e.*, fever, tuberculosis, anæmia, etc.

Abnormal Odour.—The abnormal odour of carcasses is in itself sometimes sufficient to warrant their seizure, not because such carcasses are harmful, but because they are repulsive to smell and often have a bad flavour. The abnormal odour may be sexual; old boars, bulls, rams, etc., frequently having a characteristic and repulsive odour, sometimes described as uriniferous. This odour disappears on cooling of the carcass after slaughter, only to reappear during the process of cooking.

Feeding on fish, swill, bad turnips, etc., will often produce an objectionable odour in the flesh of pigs thus fed.

Many of the aromatic drugs in use in veterinary medicine give a modified and objectionable odour to the meat, if administered in large doses shortly before slaughter; such drugs are asafœtida, aniseed, carbolic, camphor, ether, turpentine, etc. These odours are more easily observed whilst the carcass is still warm or the flesh is being cooked.

If the odour is sufficiently marked to be objectionable or repulsive, the carcass should be seized as unfit for human food.

Defective Bleeding.—When considering a carcass that appears to be insufficiently bled, if possible the cause of this deficiency should be ascertained. It may be due to fatigue, serious illness, or be the result of emergency slaughter. If it has been possible to inspect the animal before slaughter, it will be easier to decide how to deal with the carcass. In any case the meat is inferior in quality, and in many cases, if not the majority, it is repulsive, and should for that reason be seized. In all cases in

which the deficient bleeding is the result of serious illness or disease, the carcase should be condemned.

Advanced Pregnancy.—This is a condition in dealing with which the inexperienced inspector is frequently at fault. Pregnancy is a normal condition, and in itself does not render the carcase unfit for human food. It may, however, be associated with œdema, or may result in defective bleeding, and in such cases the carcase would have to be seized. In inspecting all female carcasses, the uterus should be sought for, as it is not uncommon for it to be removed in order that the fœtus may be taken out and put on the market for human food.

The Effect of Drugs on Meat.

The abnormal odour in flesh, resulting from the administration of certain aromatic drugs, has already been discussed. Here we have to consider the effect of drugs in general. An animal that has been dosed with saline purgatives shortly before death frequently, has pale, flabby, and watery flesh. Then, again, some of the cumulative drugs, such as lead, arsenic, and strychnine, render the flesh unfit for consumption, owing to their accumulating in the flesh, if they have been administered for some time; in most of these cases the flesh shows no apparent change. If, however, the animal was *poisoned* with the drug, the flesh may be pale and anæmic, with intermuscular hæmorrhages, or the carcase may be emaciated. One may in the latter cases find pieces of lead or arsenical paint in the intestinal contents, and fatty degeneration of the liver and kidneys.

Lewin has shown that the flesh of fowls poisoned with strychnine will make dogs ill if they eat it, owing to its containing strychnine.

Judgment.—If it is known that the animal has suffered from strychnine, lead, or arsenic poisoning, the carcase should be seized, even though it be marketable in appearance.

The Effect of Food on Meat.

The appearance of normal carcasses varies within certain limits according to the type of food on which the animal has been fed. Young animals fed entirely on milk have a soft, pale flesh, and it is not until the diet is changed to grass, meal, etc., that the flesh becomes firmer and darker. Changes in appearance, resulting from the diet, are more marked in the fat than in the flesh. In cattle fed largely on maize, oilcake, and brewers' grains, the fat is soft and yellow. Abnormal taste, as a result of the food, is most marked in the flesh, but is also present in the fat. Turnips, kohlrabi, rancid cake, etc., impart to the flesh a somewhat sour, acrid odour and a bitter taste. The fat of pigs fed extensively on fish—this is frequent at seaside piggeries—develops a fishy odour and taste.

Judgment.—If the carcass is otherwise of good quality, it is difficult to justify the seizure of the carcass for slight alterations in appearance or odour. But if the flesh has a marked and disagreeable odour, there should be no hesitation in declaring it unfit for the market.

The present appears a convenient opportunity to consider one or two conditions which, though not physiological, would be more out of place in any other part of this book.

Phosphorescent Meat.

Occasionally one encounters meat which in the dark emits rays of light, as the result of the growth of certain phosphorescent bacteria. The two bacteria which most commonly cause this phosphorescence, are the *Photobacterium sarcophilum* (Dubois) and the *Micrococcus plugeri* (Ludwig). The phosphorescence, is usually bluish- or greenish white, and appears on either raw or cooked meat. It disappears with the onset of putrefaction, and sponging the meat over with acetic acid is sufficient to remove it. This condition is certainly repulsive, but is not, when eaten, known to be injurious to man. The storage

room that contained the phosphorescent meat should, however, be cleansed and disinfected with acetic acid to prevent contamination of the meat subsequently stored there. Such meat need not be seized.

Fungi and Moulds.

These vegetable growths are commonly found on dried meat, such as hams, etc., in the form of either greenish, black, or grey, velvety deposits. They are found also on undried meat which is improperly preserved, and which in the majority of cases is putrid. The fungi and moulds in themselves are not injurious to health, and it is sufficient in the case of dried meat to cut away the superficial and mouldy portions of the meat. Since undried meat that is mouldy is usually putrid, it should be seized.

Artificial Colouring.

Large pieces of meat that have lost their normal colour, as a result of decomposition changes, are sometimes artificially coloured to render them normal in appearance. This deception, however, is more commonly used for sausages that are pale in colour, owing to an excess of flour being used, and also for mincemeat that is not of the required colour. At one time the usual colouring matter used for this purpose was fuchsin, but at the present time carmine, cochineal, eosin, aniline dyes, and red vegetable dyes (obtained from berries and beetroot), are also used.

Suspected fraud of this kind can be exposed by placing a small quantity of the doubtful meat, sausage, etc., in ethyl or amyl alcohol. In many cases of artificial colouring the alcohol becomes coloured a distinct red.

CHAPTER V

A few pathological changes or conditions likely to be seen—Death : Necrosis, Gangrene. Degenerations : Cloudy swelling, Caseation, Calcification, Colloid, Fatty, Hyaline, Mucoid. Infiltrations : Fatty, Amyloid disease. Amyloid bodies and hyaline degeneration. Neoplasms : *Benign* : Adenomata, Angiomata, Chondromata, Fibromata, Lipomata, Myxomata, Myomata, Papillomata ; *Malignant* : Carcinomata, Sarcomata. Pigmentation : Melanosis, Derivatives of hæmoglobin, Post-mortem discoloration.

Death.

THE death of an animal is usually reckoned from the time its heart ceases beating, but the different tissues die at varying intervals after the circulation and respiration cease. The exact moment of death of most tissues cannot be fixed. The muscles are obviously dead when rigor mortis sets in, and systemic death has certainly occurred when putrefaction commences in the tissues, or in the body fluids, not communicating with the outer air (*i.e.*, blood, urine, etc.). Immediately after death, changes occur in the structure and composition of the tissue cells. Hence, to examine their minute anatomy, the animals must be killed and the protoplasm coagulated, or “fixed,” at once (for this purpose solutions of perosmic acid, mercuric chloride, etc., are used).

Necrosis is the local physiological death of a tissue or part of a tissue. It occurs in cells of healthy tissues, but, as these are promptly replaced by fresh cells, such a condition is not classed as necrosis. But the death of a mass of cells at one spot constitutes necrosis, which may be so extensive as to involve a whole limb. The common causes of necrosis are mechanical injury, excessive heat or cold, caustics, arrest of the blood-supply (from pressure, thrombosis, or severe inflammation), and bacteria.

The condition known as 'coagulative necrosis' is the result of a sudden permanent cessation of food-supply to the part. The cell becomes swollen; its protoplasm becomes granular, and takes nuclear stains badly. This condition always precedes that of caseation (*q.v.*). If an area of necrosis becomes infected with putrefactive bacteria, gangrene results; but if the area remains germ-free, inflammation results around it, leucocytes migrate into it and break it up. Small areas may in this way be entirely removed. If the area is too large to be removed in this manner, inflammatory connective tissue is formed around it, and the area becomes encapsuled. The necrosis area may then caseate or become calcified.

Naked-Eye Appearance of an Area of Necrosis.—The area appears as a white patch, separated abruptly from the healthy parts around. Owing to coagulation of its protoplasmic constituents, it is firmer and harder than the surrounding tissue.

Judgment.—Such a tissue should not be allowed into the market. If multiple, as in bacillary necrosis of the liver, the entire organ should be condemned. But otherwise it is sufficient, before the rest of the carcass is passed, to remove the necrosed portion with a wide margin of healthy tissue. The neighbouring lymphatic glands should be examined for caseation; and if they are considered tuberculous, judgment should be given accordingly.

Gangrene is the putrefactive decomposition, due to bacterial invasion from without, of a dead area still attached to the living body. Hence deep-seated necrosed areas usually escape gangrene, whilst necrosed areas of the mouth, pharynx, alimentary tract, lungs, skin, etc., usually become gangrenous.

Gangrene is classified as *Moist Gangrene* if the part is rich in liquids. Such an area first becomes livid, then greenish or purplish black, and is swollen, non-elastic, and doughy. The putrefaction sets free gas, so that the part becomes emphysematous, and crackles on palpation. If the area is superficial the hair falls, or is easily pulled out, and

a reddish liquid exudes through the skin; or collections of foetid fluid may form under the skin. Suppuration usually supervenes, and death from toxæmia follows if the area be a large one. Small areas may slough out and be thrown off, leaving a raw granulating surface, which eventually heals over with scar tissue.

Judgment.—If the area is extensive, the flesh is ‘fevered’ and the carcase unmarketable. If, however, it is small and localized, it is sufficient to remove the affected part with a wide margin of healthy tissue.

Dry Gangrene (mummification) occurs in necrosed areas not richly supplied with fluid. This condition is sometimes seen in the tails of cattle and dogs, but is far from common in domestic animals. In dealing with such a condition, it is sufficient to remove the affected area, with a wide margin of healthy tissue.

Degenerations.

Some degenerations are changes occurring in dead tissues, but most of them are structural alterations in the living cells or fibres, induced by defective nutrition or protoplasmic poisons of unknown nature.

Cloudy Swelling, or Parenchymatous Degeneration.—This affects mainly the cells of glandular organs (*e.g.*, liver, kidney, etc.), but may affect also muscular fibres. It occurs in the early stages of acute bacterial diseases associated with a high temperature, and in certain cases of metallic poisoning (*e.g.*, arsenic, lead, etc.).

Naked-Eye Appearance.—The affected tissue is swollen and more opaque (it sometimes has a sort of cooked appearance), and is less elastic and more friable than normal.

Microscopically.—The affected cells or fibres are enlarged; angular cells (*e.g.*, those of the liver) become rounded. The cell protoplasm becomes opaque from the presence of fine granules, which may obscure the nucleus. The nucleus also is granular and opaque. These granules are proteids; they clear up with acetic acid or solution of caustic potash,

and are neither blackened with perosmic acid nor do they take nuclear stains.

Judgment.—If the carcase is otherwise fit to pass, cloudy swelling of an organ will probably be unobserved; but it is a symptom of bacterial affections and some forms of metallic poisoning, and this is sufficient to condemn the carcase.

Caseation (Caseous Degeneration).—This condition is rarely met with except in tuberculosis. It is a transformation of tissue that has undergone necrosis.

Naked-Eye Appearance.—The caseous part is usually some tinge of yellow in the ox, but in the pig is almost white. Its consistence varies from that of thick cream to that of cheese. The cheesy or firm variety may in its centre become softened and pus-like (caseopus) as the result of organisms, other than the tubercle bacillus, being present, but it occasionally occurs without such organisms.

Microscopically.—Caseation is always preceded by necrosis—usually ‘coagulative necrosis.’ As caseation proceeds, the cells become semi-opaque and dusky from the formation of numerous granules in their substance, and the nucleus disappears. The cell outline then becomes indistinct, and the cell is replaced by a mass of granular debris. Thus, in the late stages all signs of the original cell structure are lost. Completely caseous parts do not take nuclear stains, but stain yellow with picric acid.

Calcification (Calcareous Degeneration).—Calcification is usually superadded to caseation. It is a deposition in the tissue of insoluble lime and magnesium salts (usually the carbonate and phosphate). It is most commonly seen in old tuberculous lesions, but is found in old abscesses, encysted parasites, and remnants of dead tissue. Calcification is commoner in herbivora and pigs than in the other lower animals, probably because of the comparative excess of lime salts in the food of the former.

Naked-Eye Appearance.—Tissues undergoing calcification may in extreme cases become stony hard, but frequently calcified tuberculous lesions are mortar-like. The least

calcified lesions feel gritty when rubbed between the fingers or cut with a knife.

Microscopically.—The lime salts are deposited in the form of irregular opaque granules, and never as crystals. On the addition of dilute hydrochloric acid, these granules are dissolved with effervescence. Cattle and sheep from the Argentine Republic sometimes show calcareous infiltration of the lungs (Stockman).

Judgment.—Calcified tissues of any appreciable size should be seized, and the frequency of calcification of old tuberculous lesions should be borne in mind.

Colloid Degeneration.—This condition affects the epithelial cells of the kidneys, prostate gland, and thyroid; it is also occasionally met with in carcinomata. The cells become swollen and filled with a semisolid, glue-like material, usually of a brownish-yellow colour. Colloid material is found normally in the thyroid and prostate glands, and becomes a degeneration only when excessive in quantity. It resembles mucin, but is not precipitated by acetic acid, becoming swollen instead. Colloid material appears to result from a transformation of the cell protoplasm, and may either cause destruction of the cell or be periodically discharged.

Microscopically.—We find droplets within the cell, which coalesce and finally distend the cell; the droplets are transparent, and faintly yellow, blue, or green. This material has no special staining reaction.

Judgment.—Affected parts should not be allowed into the market, but be removed from the carcase.

Fatty Degeneration.—Fatty degeneration may affect the cells or fibres of any organ, but is most commonly present in those of the liver, kidney, and heart muscle. In this condition the cell protoplasm is converted into oil. It frequently follows cloudy swelling, and occurs in cases of poisoning from phosphorus, arsenic, and antimony. In many bacterial diseases it is due to the absorption of toxins, and is occasionally the result of deficient nutrition and want of oxygen.

Naked-Eye Appearance.—If extensive, the organ is enlarged, and becomes yellowish or ochre-tinted in colour. It is softer, less elastic, gives a lasting pit on pressure, and is easily torn.

Microscopically.—The cells or fibres are swollen, and the protoplasm is opaque from the presence of fat droplets (these are distinguished from the granules of cloudy swelling by not dissolving in acetic acid nor in a solution of caustic potash, and by being blackened with perosmic acid). These droplets soon become larger than cloudy-swelling granules, and when carefully focussed appear to be shining, with a dark surrounding rim. They are scattered throughout the cell, and do not displace the cell nucleus from its normal position in the centre of the cell. These fat droplets are the result of an actual conversion of the cell protoplasm into fat (see Fatty Infiltration). Fatty degeneration may result in death by heart failure or disintegration of the liver or kidneys. If the cause be removed the fat may be absorbed, and fresh cell protoplasm be formed.

Judgment.—An organ in a state of advanced fatty degeneration should be condemned; the appearance is often repulsive, and the cause often serious (*e.g.*, metallic or bacterial poisoning).

Hyaline Degeneration.—This affects particularly the connective tissue of bloodvessels; this becomes swollen, transparent, and waxy, simulating amyloid degeneration. The degenerated tissue does not stain as amyloid tissues stain.

Mucoid or Myxomatous Degeneration.—The formation of mucin occurs normally in mucous glands and in the posterior chamber of the eye. Abnormal formation or mucoid degeneration may affect either cells or fibres, which then become transparent and jelly-like. These changed cells swell on the addition of water, dissolve in alkaline solutions, and are precipitated by dilute acetic acid. Small droplets of mucin first appear in the cell protoplasm, and by coalescing eventually replace it entirely, pushing the nucleus aside. Total destruction of the cell may ensue, or

the mucin be discharged and the cell recover. The condition is met with in connective tissue, cartilage, bone, adipose tissue, and some tumours (*e.g.*, carcinomata and fibromata).

Judgment.—The degenerated part is repulsive, and should not be allowed into the market. After removal of the affected part, the unaffected parts of the carcase may be passed.

Infiltrations.

Fatty Infiltration.—This condition resembles fatty degeneration in that the cell protoplasm is replaced by oil. In fatty infiltration, however, the fat is formed, by the cell, from food material brought to it; the droplets thus formed coalesce into one or two droplets, which displace the cell nucleus to the cell wall. It is normal for liver cells to store up fat after a meal, and for adipose tissue to be formed. The condition, however, becomes pathological when fat appears in cells normally free from it, or when an excessive quantity is formed in situations where some fat naturally exists.

Microscopically.—Fatty infiltration commences with the appearance of droplets of fat in the cell substance. These soon coalesce, and, continuing to grow, distend the cell, rounding its angles and pushing its nucleus aside. Eventually the bulk of the cell is a globule of fat with a thin envelope of cell protoplasm, thickened at one part where the healthy cell nucleus is found. If resolution occurs, the fat globule breaks up and finally disappears.

Lipomatosis, or *General Fatty Infiltration*, is a name applied to excess of fat in all places normally containing fat—*e.g.*, under the skin, peritoneum, etc.—and to fat in abnormal situations, as between bundles of muscular fibres, under the endocardium, and on the heart wall itself. Except in dogs, this is not common in the lower animals.

Local Fatty Infiltration usually affects the liver only, but occasionally is found in the substance of the kidney. Fatty

infiltration of the liver is frequently associated in cattle with the cirrhosis caused by flukes (Stockman).

Judgment.—In itself this condition is not sufficient to condemn an organ. If otherwise healthy, the organ should be passed.

Amyloid Disease (Lardaceous or Waxy Disease).—Except in the horse, this condition is rare in the lower animals. In it a peculiar material, foreign to the normal animal body, makes its appearance in the organs. This rarely occurs except as the result of some other disease, and in the lower animals it is usually associated with chronic tuberculosis or chronic suppuration.

Naked-Eye Appearance.—The liver, spleen, and kidneys, are in the horse the organs commonly affected. If badly affected, the organs are enlarged and their edges thickened; they become also denser and more elastic than normal. The cut surface has a dry, waxy appearance, simulating the fat of boiled bacon. Amyloid organs withstand putrefaction until very late. An aqueous solution of iodine applied for half a minute to a freshly cut surface, after the blood has been wiped away with a cloth, colours the amyloid patches a mahogany-brown tint.

Microscopically.—The walls of the small arteries and capillaries are the tissues affected. The amyloid material is deposited or formed immediately outside the endothelium, which itself is usually healthy; but the vessel is thickened and its bore diminished. In small arteries the muscular coat is the part involved.

Amyloid material gives a characteristic staining reaction with methyl violet. Treated with a watery solution of this, it stains a rose pink, in sharp contrast with the purple tint of the non-waxy material.

Judgment.—The presence of amyloid infiltration in any organ is sufficient to condemn the whole carcase.

Amyloid Bodies.—Under circumstances that do not suggest amyloid infiltration, microscopic translucent bodies striated like a starch grain are occasionally found. These stain in a manner similar to the material present in amyloid infil-

tration. They present the appearance of successive layers of epithelial cells which have degenerated around a central nucleus.

The organs most commonly affected are the prostate and mammary glands. The significance of amyloid bodies is not known.

Neoplasms (Tumours).

A detailed description of the various neoplasms likely to be met in meat inspection is not necessary. A neoplasm is an abnormal non-inflammatory growth composed of newly-formed histological elements, and never results from the transformation of pre-existing normal tissue. Being a pathological tissue, it is unfit for human food. The words 'neoplasm' and 'tumour' are often used synonymously; but whereas most, if not all, neoplasms are tumours, many tumours are not neoplasms—*e.g.*, abscesses or any other new tissue resulting from inflammation or degeneration of normal tissues.

Neoplasms are divided into two large groups—those that are malignant, and those that are benign.

Neoplasms are classed as malignant when their growth is rapid and unencapsuled, when they tend to recur locally after surgical excision, and when they undergo metastasis—that is to say, reproduce themselves in other organs, forming so-called secondary tumours of the same nature. Metastasis is explained by the lymph or blood carrying to remote organs some of the living elements of the primary neoplasm, which are arrested in the capillaries, and there grow, multiply, and form a secondary neoplasm.

They are classed as benign when they are encapsuled, do not recur after excision, and are not metastatic.

BENIGN NEOPLASMS.

All the various types of benign neoplasms are occasionally encountered during a long course of meat inspection; but whilst some are seldom seen, others are of frequent occurrence. Among the commonest may be mentioned

fibromata and lipomata. For convenience we will take them alphabetically.

Adenomata.—Adenomata are neoplasms with a histological structure resembling that of a secretory gland. They probably never form except in connection with pre-existing gland tissue, and frequently develop in glandular organs, such as the mammary gland, liver, and kidney. They may also be found in the skin and mucous membranes, originating from the glands in those tissues.

Naked-Eye Appearance.—Adenomata are variable in appearance, but are usually soft and sometimes brain-like in consistence. They are usually well defined, but frequently have an infiltrating method of growth. In colour they are usually dirty white or greyish. The cut surface is often distinctly lobulated or glandular in appearance.

They are in themselves benign growths, but occasionally become carcinomatous, and hence malignant.

Angiomata.—Angiomata are composed mainly of vessels, either bloodvessels (*hæmangioma*) or lymphatic vessels (*lymphangioma*).

Hæmangiomata are said to be 'simple' when consisting of a meshwork of tubular vessels, and 'cavernous' when the vessels are sacculated and irregular in calibre. The *simple hæmangiomata* (the so-called 'birth-marks' of the human subject) are very occasionally found in connection with the skin, and are diffuse rather than tumour-like. The *cavernous hæmangiomata* are rarely seen except in the liver, and are in this position fairly common in cattle.

Naked-Eye Appearance.—They are usually multiple, and vary in size from a cherry to a walnut. They occur both in the liver substance and immediately under its capsule. Those under the capsule are depressed below the surrounding surface after death. On section they are dark venous red in colour, and are liable to be mistaken for extravasations of blood. Before clotting of the blood occurs they can be emptied by finger pressure.

Chondromata.—These new growths consist of cartilage. They are not very common in the food animals, and are

usually found in connection with bone, but may also be found in the parotid gland, udder, and testes. They may become partially or completely ossified.

Fibromata.—Fibromata have the structure of fibrous tissue, and are found under the skin and mucous membranes, occasionally also in the uterus, lungs, and other organs. They are well defined, usually rounded tumours with a fibrous capsule, from which they 'shell out' easily. They may be hard or soft, and in colour are white or pinkish-white. The freshly cut surface generally glistens and shows a fasciculated pattern. Melanotic fibromata (see Melanotic Degeneration) are occasionally found in the skin of oxen, particularly red oxen.

Lipomata. — These neoplasms have the structure of adipose tissue, and are found under the skin and mucous membranes and in the abdominal cavity (in the omentum or mesentery, or attached to the intestinal wall). In the abdominal cavity they are frequently of colossal size. Occasionally they are encountered in the intermuscular spaces.

Naked-Eye Appearance.—They are usually well-defined rounded tumours, resembling normal adipose tissue. During life they are often soft and semi-fluctuating, but become firmer after death, owing to 'setting' of the fat in the cells.

Myxomata.—Myxomata are usually found under the skin or mucous membrane. They are not common tumours in themselves, but other neoplasms (*e.g.*, fibromata, sarcomata, etc.) often show patches of mucoid degeneration, and have been incorrectly classed as myxomata.

Naked-Eye Appearance.—They are soft, inelastic, and doughy. The cut surface is gelatinous in appearance, very moist, perhaps even with a watery fluid draining from it.

Myomata.—These are far from common in the lower animals, but are occasionally found in the uterus of sows, and, on rare occasions, subcutaneously and in connection with the muscular tissue of the stomach and intestines. They consist of involuntary muscular tissue similar to that of the stomach and intestines.

Naked-Eye Appearance.—They are firm, well defined, and frequently encapsuled. The cut surface is of a greyish colour and shows marked fasciculation.

Papillomata (Angleberries of the Ox).—These may be found on the skin or mucous membrane anywhere, but in food animals are more frequently seen in the pharynx and cesophagus of cattle, or attached to the skin on the under-surface of the abdomen. They are frequently multiple, but are not malignant.

Naked-Eye Appearance.—The growths are branched, and for that reason are often termed ‘warts.’ They are usually pear-shaped and attached by their narrow end. The cut surface shows a dirty white centre or cone of connective tissue, often distinctly horny and dry, surrounded by a more vascular epithelial and irregular zone.

Judgment.—Benign tumours are strictly local affections, and from a sanitary point of view are of minor importance. Organs affected may be made marketable by removal of the growth.

MALIGNANT NEOPLASMS (CANCERS).

In food animals, malignant growths are rare in comparison with the benign or non-malignant tumours; but they are occasionally met, and for that reason a few general remarks will not be wasted.

Carcinomata.—These may be found in connection with the skin, or the mucous membrane of the mouth, cesophagus, or intestines, or in any of the secretory glands (*e.g.*, liver, kidney, pancreas, parotid, etc.). They consist of masses of epithelial cells embedded in a vascular connective tissue.

Naked-Eye Appearance.—They vary in consistence. The soft varieties are brain-like in consistence, and the harder varieties may be described as scirrhus. They are usually greyish in colour, but may be melanotic. They are never sharply defined, but appear to merge into the tissues from which they are growing. They grow rapidly, and undergo metastasis by means of the lymphatic vessels, so that

secondary growths of a similar histological structure are found in the lymphatic glands of the affected area.

When important organs are invaded, the carcase is usually emaciated, and the flesh pale and flabby.

Judgment.—Malignant growths are not transmissible by ingestion, and, if the carcase is in good condition, it is sufficient to seize the affected parts. If there are numerous secondary growths in remote parts of the body, seize the entire carcase, whether it be emaciated or not.

Sarcomata.—Sarcomata are malignant growths composed of embryonic connective-tissue cells, which may be either round or spindle-shaped, and large or small. For the purposes of this work it is unnecessary to describe the various histological types of these neoplasms.

Naked-Eye Appearance.—They may be found in connection with the skin or mucous membranes (round-celled variety), and are then rather soft and of the consistence of a lymphatic gland. These tumours are usually greyish or pinkish-white and unencapsuled. Being highly vascular, they show small hæmorrhages on the cut surface.

They may also originate from any of the dense fasciæ, and from tendons, or from the periosteum (spindle-celled variety), and are then firm and may be mistaken for fibromata. These are rarely encapsuled, and usually pinkish-white in colour.

Sarcomata connected with bone (giant-celled variety) are often hard, gritty, and partially ossified.

Melanotic sarcomata (see Melanotic Degeneration) may be found subcutaneously about the limbs of cattle, usually red cattle. These are not so malignant as the other varieties.

Sarcomata spread by metastasis as a result of living elements being carried from them by means of the blood-stream. As a result, secondary growths are found in either the lungs or the liver.

Judgment.—If there are secondary growths in the lungs or liver, the entire carcase should be seized; for although the condition is not transmissible by ingestion; the idea is

repulsive, and the consumer is not obtaining food of the nature and quality demanded. If there are no secondary growths, and the carcase is in good condition, seizure of the affected parts is all that is required.

Pigmentation.

Pigment is normally found in the skin, eye, and mucous membrane of the mouth in cattle and sheep, and sometimes in the dura mater of sheep. The normal pigment is melanin. This pigment is occasionally coal black to the naked eye. Microscopically it consists of brownish-black granules, which are soluble in hot liquor potassæ. It is mainly found in epithelial cells, but occasionally in connective tissues.

Pathological pigmentation may be due, however, not only to melanin, but to derivatives of hæmoglobin from the blood, or to particles of carbon.

Melanosis.—Melanotic patches the size of a five-shilling piece may be found in the skin or the mucous membranes, or in the liver and lungs of young calves. Sarcomata and other neoplasms occasionally undergo melanotic degeneration, particularly in grey horses and red cattle.

Derivatives of Hæmoglobin.—1. **Hæmosiderin** gives rise to discoloration of the tissues around an injury, where blood has been extravasated (*e.g.*, bruises). The neighbouring lymphatic glands also become pigmented by the action of the leucocytes carrying the pigment. Hæmosiderin is deposited in the form of brown granules.

2. In the tissues, at the seat of considerable extravasations of blood, **Hæmatoidin** is deposited from the blood in the form of ruby-coloured rhombic crystals.

Anthraxis.—Continuous inhalation of carbon particles produces in the lungs and bronchial glands an appearance of pigmentation. In the lower animals this condition is never very marked, except in pit ponies. Microscopically the carbon particles are black; the small particles are spherical, and the larger ones irregular. They are quite insoluble in either strong acids or alkalies.

Pigmentation by Bile.—Catarrhal affections of the bile-ducts, or blockage of the main bile-ducts by flukes or other obstruction, may cause jaundice. The bile, instead of entering the intestinal tract, is absorbed into the circulation, and stains the tissues. The intensity of pigmentation varies; all the tissues, except muscle, may be faintly tinged or deeply coloured yellow. In bad cases of jaundice the muscles are of a dirty brown colour, are flabby, and have a nasty flavour. In cases of doubt, evidence of the presence of bile-pigment should be sought by Gmelin's test. It should be remembered that a yellow-coloured fat is produced by some foods, and is normally present in old cattle.

Gmelin's Test.—A drop of the tissue juice is treated with a drop of yellow nitric acid. When the two drops come in contact, a play of colours (brown, green, blue, red, and yellow) results, which is due to the various oxidation products of bilirubin.

Judgment.—Tissues containing abnormal pigment should be seized. Except in marked jaundice, total seizure is usually unnecessary, for slight tingeing of the membranes does not justify it, as bile is not a poison. The exact degree of pigmentation necessitating seizure must rest with the inspector.

Post-Mortem Discoloration.—This may be due to staining with bile which has oozed from the gall-bladder, or, during putrefaction to the action of sulphuretted hydrogen on the iron of the hæmoglobin, the two forming sulphide of iron. This occurs more rapidly in hot weather. Bile-stains alone are localized, and are greenish-yellow, but decomposition will make them turn green or black.

Owing to the amount of iron in the spleen, this organ often becomes black with the onset of putrefaction.

CHAPTER VI

Natural death and emergency slaughter. Septic conditions: Sapræmia — Septicæmia — Pyæmia — Suppurative lesions. Meat-poisoning : Putrefying meat—Putrid infection of meat—Putrid intoxication of meat. 'Blown meat.'

BEFORE dealing with the subject of meat-poisoning, it will be well to refer to one or two conditions that frequently precede such attacks.

Natural Death of the Animal.

Death, from natural causes, of the various food animals is far from common ; for rather than allow the animal to die, it is slaughtered, at the 'eleventh hour,' with a view to obtaining a better bled carcase.

The carcase of an animal which has died a natural death shows fulness of the bloodvessels (particularly in the viscera), blood-streaks in the tissues, a moist subcutis, and a dark red appearance of the flesh. There may also be absence of the slaughter wound, although this can, of course, be made after death.

The carcase, taken as a whole, has a bad appearance and decomposes rapidly.

Judgment.—Speaking generally, the carcase of an animal dead of natural causes should not be allowed into the market for human food. There are, however, exceptions, such as death from accidents—*i.e.*, breaking the neck, punctured wounds of the heart, traumatic rupture of the spleen, etc.

Emergency Slaughter.

1. For **Accidents**.—Food animals suffering from mechanical injuries that may endanger life, or render future life useless, such as fractures, penetrating wounds of the abdomen, obstructed parturition, choking, etc., may very rightly be slaughtered at once, as the carcase—except for any injured part—is quite fit for human food. If slaughter is postponed, sepsis may set in and render the entire carcase unfit for human food.

2. For **Illness**.—Animals that are at the point of death are occasionally slaughtered so that bleeding will not be quite incomplete, and the carcase will thus *appear* fit to be put on the market. It is in cases like this that compulsory examination of food animals before slaughter would save the consumers from serious unsuspected dangers.

Judgment.—The carcasses of animals killed when about to die from illness should not be passed as fit for human food—first, because the fatal disease in many cases renders the flesh dangerous to man; and, secondly, because, the bleeding being deficient, decomposition sets in early, and the unsuspicious consumer keeps the meat only to find it putrefying and unfit to eat.

Septic Conditions.

As the terms ‘sapræmia,’ ‘septicæmia,’ and ‘pyæmia,’ are likely to be used frequently in subsequent pages of this work, the present seems a suitable opportunity for giving a brief explanation of their meaning.

Sapræmia.—Bacteria or microbes growing in the tissues or fluids of the body, manufacture substances which pass into the general circulation, and act injuriously on some of the cells of the body. In some cases, such as tetanus, diphtheria, etc., the toxic substances are of tremendous potency, as may be easily demonstrated experimentally. But in other cases one can only infer that there is in operation some injurious substance which has been manufactured by the bacteria.

There are some bacteria that are incapable of living and multiplying in the blood or living tissues—*e.g.*, many of the bacteria concerned in putrefaction—and large numbers of these bacteria may be inoculated into an animal without inducing any very serious effect, since they are promptly destroyed. Yet under certain conditions these same bacteria are able to act most injuriously on animal life through substances which they have manufactured. For instance, when large masses of dead tissue, still attached to the living body, or extensive accumulations of inflammatory exudate (pleuritic or peritoneal, etc.), become invaded by putrefactive bacteria, these grow with almost as much freedom as on the same materials in a dead body or outside the body, manufacturing as they grow, toxic substances which are absorbed and circulated through the living host. This condition, in which toxic substances, and not bacteria, are circulating through the animal system, is termed *sapræmia*.

Septicæmia.—When the main seat of multiplication of a pathogenic organism is the blood, the condition is called *septicæmia*. In this sense anthrax, at the time of death, is a typical septicæmia. Some organisms are septicæmic in one species of animal, and not in others; *e.g.*, fowl cholera is septicæmic to fowls and rabbits, but in guinea-pigs it is a purely localized disease, the bacteria growing only in the solid tissues in and around the place where they are introduced.

Pyæmia.—Some pathogenic organisms never multiply in the blood, but grow in the solid living tissues. When such organisms encroach on a bloodvessel the wall of which ultimately gives way, permitting the bacteria to enter the circulation, these are carried by the blood-stream until arrested in the first set of capillaries they pass into. The organisms, however, are using the blood simply as a means of transit, and not as a medium for multiplication. Such a condition is described as being a *pyæmia*.

Suppurative Lesions.—Suppurative lesions may be found in any organ or part of the body of any of the food animals, and are, in fact, lesions of frequent occurrence.

The organisms (pyogenic organisms) most commonly held responsible for these lesions in the lower animals are the staphylococci and streptococci; but other organisms, such as tubercle bacilli, glanders bacilli, botryomyces, etc., are also responsible for the formation of lesions containing pus.

Staphylococci are tissue parasites to be found in abscesses and similar lesions. A smear of pus from such a lesion, on a cover-glass and stained with methylene blue, when examined with a microscope, shows the staphylococcus to be a spherical organism (coccus), with a tendency to grow in irregular clumps resembling miniature bunches of grapes (Fig. 18).

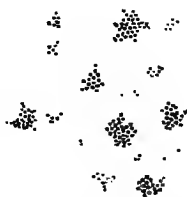


FIG. 18.—STAPHYLOCOCCUS
PYOGENES AUREUS. $\times 500$.



FIG. 19.—STREPTOCOCCUS
PYOGENES. $\times 500$.

This large family of cocci is responsible for many acute abscesses, suppuration of wounds, and cases of pyæmia.

Streptococci, also, are tissue parasites frequently found in abscesses, etc. A smear preparation of these organisms shows the streptococcus to be a spherical organism, with a tendency to grow in chains. These chains may consist of only two or of a dozen or more individual cocci (Fig. 19).

Organisms of this class are responsible for lesions similar to those caused by staphylococci.

The Lesions.—Some of the causal organisms become deposited in the affected part, either as the result of injury in the first case, or by metastasis from an already existing lesion in some other part of the body. The primary lesion may exist in connection with a superficial wound, or some organ connected with the outside world (alimentary tract,

lungs, or urino-genital passage, etc.). Having obtained a footing, the organisms multiply, and by their products of metabolism liquefy the adjacent tissues, and at the same time attract the white corpuscles (leucocytes) of the blood. In this way a cavity forms containing a fluid (pus) of varying thickness, consisting of water, fat, albumin, and leucocytes, and containing many of the causal organisms. Such a lesion is called an 'abscess,' and may be met with in any part of the body. A similar course of events will lead to the formation of pus in the pleura (empyema), pericardium (pyopericardium), peritoneum, or uterus.

A superficial abscess generally increases until the tissue separating it from the outside world is 'liquefied'; the abscess then bursts and discharges its contents. Deep-seated abscesses (in the internal organs, muscle, etc.), however, often become surrounded with an inflammatory capsule of fibrous tissue and dry up, leaving a mortar-like mass, which may become gritty or calcified.

Should an abscess involve an adjacent bloodvessel, some of the organisms may enter the blood-stream and be carried to remote parts of the body (pyæmia), where fresh abscesses will be formed. These secondary abscesses may be, and often are, few in number; but frequently they are so numerous as to stud the internal organs, appearing as innumerable small yellow spots, all about the same size.

Judgment. — When innumerable abscesses are found throughout an organ, or when abscesses are found in two or more internal organs, one may conclude that organisms have been circulating in the blood-stream (pyæmia), although, perhaps, in small numbers. In such a case the whole carcase should be seized. Exception may, however, be made in the case of multiple abscesses in the liver only, in navel-ill (*q.v.*), in which disease the rest of the carcase may be judged on its merits. When superficial abscesses exist and the neighbouring lymphatic glands are healthy, it is sufficient to remove and destroy the affected parts, including not only the abscess, but the infiltrated oedematous tissues surrounding it. If, however, the glands

for that area are diseased, the whole of the region should be seized.

An old encapsuled abscess of an internal organ requires seizure of that organ only, or removal of the abscess with a wide margin of healthy tissue, according to the size of the abscess. But fresh abscesses elsewhere, suggesting a recent pyæmia, will indicate seizure of the carcase.

Localized but extensive suppuration (*e.g.*, in the uterus, chest, peritoneum, etc.) usually necessitates seizure of the entire carcase, for in such cases the flesh is 'fevered,' watery, sets badly, and soon putrefies, as the result of sapræmia.

Small localized abscesses, accompanied by symptoms of fever before death, and containing foetid pus, for a similar reason call for total seizure of the carcase.

What the inspector has to decide is the question, Has there been pyæmia or sapræmia? In either case the whole carcase must be seized. If he decides that neither of these conditions exists, it is sufficient to seize only the affected part, organ, or region, as the case requires.

Meat-Poisoning.

As the symptoms and course of outbreaks of meat-poisoning vary considerably, so also do the causes of those outbreaks. For convenience of description, meat-poisoning may be divided into three groups. These three groups, although differing materially in themselves, are all capable of causing illness, the symptoms of which will be found to overlap, and clinically be often indistinguishable. The three suggested groups are cases due to—

1. Decomposing or putrefying meat.
2. Putrid intoxication of meat.
3. Putrid infection of meat.

Decomposing or Putrefying Meat.—Decomposition of meat is the result of the growth of putrefactive bacteria in or on the meat, the bacteria having reached this, after the death of the animal.

The actual organisms responsible for this change in meat are legion, but the variety most commonly found on examination of meat, some of which had caused illness in the consumers, is the *Proteus vulgaris*.

During the growth of the organisms in the meat, whether cooked or raw, the proteids of the meat are split up, and poisonous substances (ptomaines and albumoses) are formed. The other products of the decomposition are various aromatic substances, fatty acids, and ammonia. The poisonous substances produced are *occasionally*, but *not usually*, rendered harmless by the process of cooking, according to the organism responsible for their production.

Flesh in an advanced stage of putrefaction is softer than usual, slimy, and of a colour varying from dark green to black. It is often emphysematous, owing to the formation of gases by the putrefactive bacteria. The gases vary somewhat in odour, often being sour or resembling sulphuretted hydrogen.

The early decomposition of meat is often difficult, if not impossible, to recognize, as the slight odour is easily overlooked, and the colour and appearance of the meat at this stage are frequently unchanged.

Recognizing that free ammonia is always liberated from decomposing meat, W. Eber recommended the following test for putrefying meat:

1. Pour 1 inch of a solution consisting of hydrochloric acid (1 part), alcohol (3 parts), and ether (1 part), into a large test-tube. Cork and shake.

2. Rub the suspected meat with a glass rod, and dip the rod into the test-tube till it touches the solution at the bottom. In doing this avoid touching the sides of the test-tube with the rod.

3. If ammonia is present, a white cloud surrounds the rod, the density of the cloud increasing with the degree of decomposition.

In the case of suspicious 'joints,' incise down to the bone, and rub the glass rod on the deeper parts. Although

this test is very suggestive of decomposition, it is not quite conclusive, as it is obtained normally with salted meat.

Judgment.—On account of its poisonous properties, putrefying meat should be seized. It is true many people prefer the flesh of game, deer, and even mutton, slightly 'high'; but the sale of putrefying meat should not be permitted, and consumers who prefer to eat putrid meat should be obliged to keep the meat until its putridity suits them.

Putrid Intoxication of Meat.—When considerable masses of dead tissue still attached to the living body, or extensive accumulations of inflammatory exudate (pleuritic, pericardial, or peritoneal), become invaded by putrefactive bacteria, the bacteria may grow with almost as much freedom as in the same material outside the living animal body. But the substances which they manufacture are apt to be absorbed into the circulation, impregnating the tissues, and producing in them a condition of putrid intoxication (sapræmia).

From numerous recorded cases of meat-poisoning, it is clear that various septic conditions in the animals have been the cause (Bollinger at Munich, 1880). It is impossible to enumerate all the conditions that have been credited with causing such outbreaks, but by mentioning a few of the more frequent conditions a good general idea may be conveyed.

Among the most commonly recorded causes is septic metritis in cows, appearing shortly after parturition, and septic arthritis (joint-ill or navel-ill) in young calves. The flesh of animals suffering from these diseases has been the cause of a large number of cases of meat-poisoning, many of them leading to fatal results.

In all conditions such as these, the animal's body is absorbing and becoming soaked in the soluble toxins, or poisons, that are being produced in the suppurating organ, without the actual causal organism leaving the seat of growth. The majority of the toxins thus formed, when

stored up in the flesh and other tissues, are quite unaffected by the ordinary processes of cooking, and when ingested with the meat they are absorbed by the consumer, and in an hour or so, set up the various symptoms met with in meat-poisoning. In cases such as these, the severity of the symptoms depends on the amount of the toxins ingested, as the causal organisms are not present in the meat.

Besides the diseases enumerated above, outbreaks of meat-poisoning have been traced to the consumption of the flesh of animals suffering from septic peritonitis, septic mammitis, persistent fœtid diarrhœa, suppurating fractures and wounds, and of animals slaughtered when moribund from unrecognized disease.

Judgment.—It is under these circumstances difficult to decide when the flesh is unfit for food. The inspector must use his own judgment as to the probable duration of the particular disease, its extent, and the stage it has reached. In the case of small and recent septic conditions it will usually be sufficient to remove the affected parts; but in old-standing, advanced septic conditions, particularly when the carcase is poor, or when there are secondary abscesses, there should be no hesitation in condemning the whole carcase.

Putrid Infection of Meat.—Some of the strictly putrefactive bacteria—*i.e.*, bacteria which as a rule live on dead organic matter, and so produce substances of unpleasant odour—are also capable of multiplying in the living tissues. Putridity of the living tissues is probably never met, but the term ‘putrid infection’ is applied to cases in which there is an actual invasion of the blood and living tissues by organisms that are ordinarily putrefactive.

Gaertner, in 1888, was one of the first to demonstrate the presence of a bacillus in meat that had caused an outbreak of meat-poisoning. The animal from which the meat was obtained had been affected with persistent diarrhœa. The bacillus in question was isolated, and named by Gaertner the *Bacillus enteritidis*.

The *Bacillus enteritidis* belongs to the coli group of

organisms, being in its properties intermediate between the *Bacillus typhosus* and the *Bacillus coli*.

It resembles the *Bacillus typhosus* in its morphology, in the number of its flagella, in being motile and in not coagulating milk or producing indol.

It resembles the *Bacillus coli* by its brownish growth on potato, by fermenting glucose, dulcitol, and mannitol, but not lactose or saccharin.

It produces acid and gas in glucose, does not liquefy gelatine, nor does it stain by Gram. It produces a chemical poison that is not rendered harmless by cooking.

This bacillus has since been frequently obtained from meat, causing outbreaks of poisoning. Other organisms, but in isolated cases only, have been obtained, such as the sausage bacillus of Gaffky and Paak, the Moorseele bacillus of Van Ermengem, the Rotterdam bacillus of Poels and Dhont.

Some of the meat-poisoning bacilli form toxins that are rendered harmless by cooking, but this is the exception rather than the rule.

All the described bacilli, so far held to have caused symptoms of meat-poisoning, belong to the *Bacillus coli* group, but differ both pathologically and biologically from that organism. The meat responsible for this class of meat-poisoning is in the majority of cases obtained from animals suffering from long-standing gastro-intestinal trouble.

Judgment.—This is the form of meat-poisoning most difficult to prevent, as the carcasses of *all* animals suffering from diarrhoea cannot be seized. The inspector must use his own discretion, taking into consideration the condition and appearance of the carcass, the odour of the intestinal contents, and the condition of the intestinal mucous membrane.

Prevention of Meat-Poisoning.—To avoid the risk of occasional outbreaks of meat-poisoning, it is essential that animals intended for human food should shortly before slaughter be examined by a competent inspector, who should subsequently inspect the carcass. Of no animal

that was slaughtered because it was dying of disease, or was so seriously ill that death was expected, should the carcass be allowed into the market. All carcasses of animals dead from natural causes (except accidents, *q.v.*), or suffering from enteritis, chronic foul diarrhœa, or continued septic conditions, should be considered unfit for human food, and should be seized. If in doubt whether a carcass is fit for human food or not, the benefit of the doubt should be given to the consumers, not to the vendor.

It has been suggested (Augst) that in cases of emergency slaughter, if the meat shows an alkaline reaction within twenty-four hours, such meat should be considered unfit for human food. To obtain the reaction of the meat, make a deep incision into the muscles of the thigh, and press against the freshly cut meat surface a piece of neutral litmus-paper (previously moistened with water). For this purpose use a knife, as the finger is frequently acid. After about ten minutes' contact, remove the litmus-paper, and compare it on a white slab with moistened neutral litmus paper. If the meat be acid, the litmus-paper will turn pink; if the meat is alkaline, a blue colour will result.

'Blown Meat.'

Meat that is infected by the deposition upon it of the eggs or larvæ of flies is known as 'blown meat.'

There are three flies that commonly contaminate meat in this manner—viz.:

1. The house-fly (*Musca domestica*).
2. The blow-fly (*Musca vomitoria*).
3. The flesh-fly (*Sarcophaga carnaria*).

The house-fly and the blow-fly both deposit their eggs on either fresh or decomposing animal matter, and in twenty-four hours these hatch out into larvæ.

The flesh-fly, however, deposits living larvæ on decomposing animal matter only. These larvæ when one day old are 1 millimetre ($\frac{1}{25}$ inch) in length, and they continue to increase in length 1 millimetre a day, till on the tenth day they are 10 millimetres ($\frac{2}{5}$ inch) long.

CHAPTER VII

A few general diseases: Anæmia—Endocarditis—Fevered flesh—
Fatigue—Joint-ill—Leucocythæmia—Septic metritis—Mammitis
—Nephritis—Pleurisy—Peritonitis—Pneumonia.

THE next subject for consideration will be a few general diseases that for convenience may be taken alphabetically. Following on these will come the pathological conditions most commonly found in the more important organs.

Anæmia.

This term, as generally applied, indicates a condition of the blood in which there are too few red corpuscles, or in which these, even if they are numerically sufficient, contain too little hæmoglobin. The normal number of red corpuscles in the blood of oxen is 8,000,000 to 9,000,000 per cubic millimetre, and in sheep 11,000,000 to 12,000,000 per cubic millimetre. In ox blood the quantity of hæmoglobin present in the red corpuscles is 68 per cent., in sheep blood 58 per cent.

To be certain of the existence of anæmia, a microscopical examination of the blood is necessary; but for ordinary meat inspection, if the changes are so pronounced as to attract attention, they are usually sufficient to warrant seizure of the carcase.

The most severe and plainly marked form of anæmia (pernicious anæmia) in animals is probably toxic in origin, being due to the presence of parasites in the blood (protozoa), liver (flukes), lungs (strongyles), or intestines. In many cases, however, the anæmia appears to be the sole disease, and no cause of the condition is found.

Appearance of the Carcase.—The carcase is emaciated, and the flesh, which is paler than normal, is watery and flabby. Small hæmorrhagic spots are often noticeable in the organs and muscles, and on the serous membranes.

Judgment.—Carcases with the appearances above described should be seized as unmarketable.

Endocarditis.

By this is understood an inflammation of the membrane lining the heart cavities and valves. General endocarditis is never met with, the disease being confined to the valves and the adjacent parts of the heart wall.

Acute Endocarditis is usually bacterial in origin. It is found in the course of such diseases as swine erysipelas, pyæmia, acute rheumatism, etc. The condition is rare in domestic animals, except the pig, and in that animal is usually a complication of swine erysipelas.

Lesions.—On one or more of the valves, most commonly the mitral, is found either an ulcerative surface or a dirty white collection of fibrin and white corpuscles, heaped up so as roughly to resemble a cauliflower. The vegetation, as it is often called, is soft and easily broken down. It may occasionally be almost large enough to occlude the orifice guarded by the valve.

Chronic Endocarditis is commonly the remains of an acute attack. The vegetations, having shrunk, become tough and fibrous, leaving the valves puckered, frequently with adhesions between the valve cusps themselves, or between them and the heart wall. Calcification of the old lesion also occasionally occurs.

Judgment.—In acute cases, bearing in mind their bacterial origin, the entire carcase should be seized. In chronic cases it is unnecessary to interfere if the carcase is otherwise healthy.

Fevered Flesh.

In the majority of cases, the rise in temperature which causes the changes found in *fevered flesh* is due to the

presence of toxins, generally of bacterial origin. As a result of their presence, there is increased metabolism in the tissues generally, but chiefly in the muscles.

Appearance.—The muscles show small hæmorrhages in their substance, and as a result of attendant bad bleeding they are darker than usual, show an abnormally large blood content, and are sticky to the touch.

Judgment.—If from any cause ‘fevered’ to a repulsive degree, the entire carcase should be seized. If ‘fevered’ from some generalized bacterial disease, this condition is alone sufficient to warrant seizure of the carcase, whatever the degree of tissue changes may be.

Fatigue.

This condition is the result of the accumulation in the system, after excessive exertion, of waste products of a poisonous nature. These poisons, under such circumstances, are formed more quickly than they can be eliminated.

Much of this excess (in the form of creatin, creatinin, etc.) accumulates in the muscular tissues, causing, in composition and appearance, changes which pass off after a short rest. If, however, the animal be slaughtered during a state of fatigue, the changes persist, and as a result the animal bleeds badly. The muscles are then dark, sticky, and do not set firmly. Putrefaction also sets in early.

Judgment.—Such carcases are usually unmarketable, from their repulsive appearance. The flesh, though it is tough, tasteless, and soon putrefies, is not in itself harmful as food. The slaughter of fatigued animals should not be permitted till after some hours of rest, so as to avoid these changes and render the carcase marketable.

Joint-Ill or Navel-Ill.

Although these are not synonymous terms, the diseases are closely allied. Navel-ill is the name applied to a suppurating condition of the umbilicus met with in calves and lambs, shortly after birth. The umbilicus fails to

heal properly, and there is a chronic, dirty, blood-stained discharge. Occasionally the umbilicus closes, and abscesses appear under the surrounding skin. The blood-clots in the umbilical vessels provide a good soil for the causal organisms, which by spreading up the vessels produce numerous abscesses in the liver, followed by a pyæmia and the formation of abscesses in any part of the body.

The causal organisms (staphylococci and streptococci) of navel-ill frequently produce suppurative inflammation of certain joints, most commonly the carpal and tarsal joints, but occasionally of the elbow, stifle, and hip joints. This may occur with or without closure of the discharging umbilicus, and is distinguished by the term 'joint-ill.'

Symptoms.—The calf or lamb is obviously ill, is wasting, and has a discharge of dirty, blood-stained pus from the navel, and perhaps local abscesses. When joint-ill sets in, hot, fluctuating, tender swellings form at the affected joints, and the animal either walks lame or refuses to stand.

Judgment.—Straightforward navel-ill necessitates removal only of the affected parts. But the presence of abscesses in any of the organs or joints, indicating that there has been a pyæmia, necessitates complete seizure of the carcase.

Leucocythæmia.

Leucocythæmia is a disease of the blood in which there is so large an increase in the number of white cells that these may even outnumber the red corpuscles. As a result the blood is very pale. This condition of the blood is accompanied by enlargement of the spleen and lymphatic glands, and an excess of white cells in the bone marrow.

The **Spleen** may be enlarged to several times its normal size, is pulpy, and on cross-section is reddish-white.

The **Lymph Glands** are enlarged enormously, and many normally unnoticeable small glands may be now as large as walnuts. Besides enlargement, the lymph glands are soft, resembling brain in consistence, and on cross-section a thick white fluid exudes from the cut surface.

The **Bone Marrow** will be found to be reddish-white in colour, and to contain an excessive number of white cells.

According to the site of the most marked changes, the disease is classified as splenic, lymphatic, or myelogenous leucocythæmia.

The flesh will be found to be pale, and to show numerous small hæmorrhages in its substance.

Judgment.—Guided by the degree of enlargement of the lymph glands and the general appearance of the carcase, this should be seized.

Septic Metritis.

Septic infection of the uterus resulting, after parturition, from the entrance of pyogenic or putrefactive bacteria, is, with the exception of the cow, seldom seen among food animals. As the result of a retained piece of placenta that is putrefying, or of a collection of pus in the uterus, there is during life severe systemic disturbance, and 'fevered flesh' post mortem, both conditions caused by absorption of decomposition poisons from the uterus.

Naked-Eye Appearance.—There may be only a putrefying piece of placenta, or the uterine wall may be thickened, œdematous, and congested, with a collection of foetid reddish-brown fluid in the uterine cavity. There is usually marked congestion and œdema of the surrounding pelvic tissues, and often local peritonitis. In long-standing cases there may be abscesses in the adjacent pelvic tissues.

Septic thrombosis of the pelvic veins is a frequent complication, and precedes the formation of metastatic (embolic) abscesses.

The lungs occasionally show patches of putrid pneumonia, the consolidated patches being on cross-section dull red or grey in colour, and having an offensive odour.

Ecchymoses are present on the serous membranes, and there may be septic peritonitis with foul-smelling fluid in the peritoneal cavity.

Judgment.—The carcase is *usually* badly bled, dark, and repulsive. This condition alone is sufficient to condemn

it. If the metritis be purely local, with no signs of 'fevered' flesh, systemic disturbance, or septic lesions other than in the uterus, it will be sufficient to seize the affected organ.

It should be remembered that this condition has frequently been the cause of outbreaks of meat-poisoning. If any doubt exists as to its fitness for the market, seize the entire carcase.

Mammitis (Mastitis. or Inflammation of the Mammary Gland).

The normal udder of the cow consists of four glands or quarters, anatomically distinct from one another, and arranged in anterior and posterior pairs. Each of these quarters is surrounded by a connective-tissue capsule, from which fine strands of connective tissue pass into the gland, dividing and subdividing it into lobes and lobules. The lobules consists of collections of acini, which have potential cavities lined by the milk-secreting epithelium. The secreted milk is drained from the acini by milk-tubes which, uniting with similar tubes from neighbouring acini, form the milk-ducts. These milk-ducts terminate in the milk sinuses or reservoirs at the bases of the teats. Traced upwards, each teat is traversed by one duct, which at the base of the teat opens into a dilatation—the milk-sinus.

In the walls of the milk-sinuses, therefore, may be seen the orifices of the various milk-ducts, which bring the milk from the milk-producing acini. These reservoirs are capable of much distension, and in them the milk collects until it is drawn off by the process of 'milking' (Fig. 20).

The udder as a whole, therefore, has four serviceable teats (*i.e.*, one for each quarter), but it is normal to find one or two extra rudimentary and useless teats.

Two types of simple mammitis are commonly described, according to the histological elements of the gland primarily affected.

The term 'parenchymatous mammitis' refers to cases in which the secretory glandular tissue is primarily affected, whilst 'phlegmonous mammitis' is the name applied to those

PLATE II.

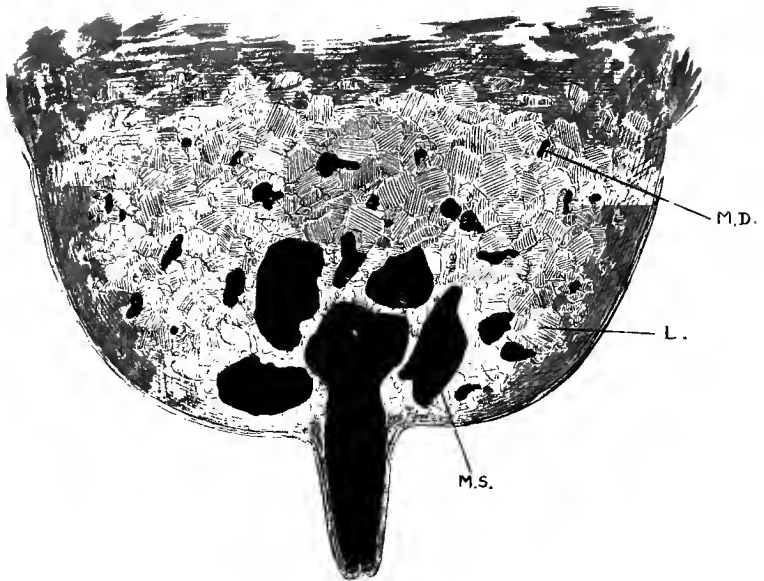


FIG. 20.—A DIAGRAM DRAWN FROM A SECTION THROUGH ONE QUARTER OF A COW'S UDDER, SHOWING THE MILK-RESERVOIRS (MS) AND MILK-DUCTS (MD) DISTENDED WITH COLOURED GELATINE.

L=a lobe consisting of lobules with their acini.

cases in which the primary changes occur in the interstitial connective tissue of the gland. In chronic cases of the parenchymatous variety marked changes will, however, be noticed in the interstitial connective tissue.

Etiology.—Injury is occasionally responsible for an attack of mammitis, but without subsequent infection with bacteria the condition is but transient, lasting only a few days. Many species of pyogenic organisms are responsible for inflammatory conditions of the mammæ, those most frequently found being streptococci. By simple staining processes, such as methylene blue, the causal organism can usually be demonstrated in the milk and in the acini of the udder. In some cases of septic mammitis leading to outbreaks of meat-poisoning, the *Bacillus enteritidis* of Gaertner has been demonstrated in the udder.

Animals affected.—The cow is most commonly affected, but occasionally heifers, goats, and ewes. In the last-named the condition often leads to gangrene of the udder.

Symptoms during Life.—The form most commonly found, is an acute mammitis which may be cured, but which frequently becomes chronic.

In the acute stage the cow has a raised temperature, is dull and feverish, and refuses her food. She walks with her hind-legs widely separated, and resents any digital examination of the udder. The affected quarter is tender, hot, and swollen, the skin over it is dry and tense, and the milk almost suppressed. Frequently a small quantity of thick blood-stained fluid may be obtained from the affected quarter. In the later and chronic stages, there is little or no systemic disturbance, and the udder is less tender. There is often a blood-stained, thick, foul discharge from the teat, and occasionally abscesses have formed and are seen to be discharging by sinuses through the skin. (See Tuberculous Mammitis.)

Appearance of the Gland post Mortem.—In the acute stage enlargement of the affected 'quarter' or 'quarters' is found; the gland tissue is pink, and may show small hæmorrhages; the acini contain a blood-tinged, creamy liquid.

Microscopically the acinal wall is swollen and infiltrated with round cells, and the lining epithelium is seen to be proliferating. The acinal contents include leucocytes, red corpuscles, proliferated epithelium cells, and bacteria of various kinds, mostly cocci.

After some duration of the disease—*i.e.*, in the early chronic stage—the affected ‘quarter’ or ‘quarters’ will be found much enlarged and firmer than normal, owing to the formation of an inflammatory connective tissue, and there may be abscesses forming in the gland tissue. The acini then contain thick yellow pus, often foetid, and strands of newly-formed inflammatory tissue are noticeable around the affected areas.

In a very chronic case, the affected quarter is hard, irregular, and smaller than the healthy quarter, owing to contraction of the inflammatory tissue. There may also be abscesses discharging through the surface. The inflamed quarter on section is tough, and exhibits coarse-grained fibrous tissue containing abscesses and surrounding small islands of atrophied gland tissue.

The supramammary lymphatic glands are unchanged except in the foul, purulent form of mammitis, when they are enlarged and oedematous.

The Flesh of the Carcase.—Animals killed in the acute stage of mammitis have a dark ‘fevered’ flesh. In the chronic cases the flesh is frequently normal, but in the foul, purulent form it has an unpleasant odour, and putrefaction sets in quickly.

Judgment.—1. Always seize the udder and its lymphatic glands.

2. If the animal has been slaughtered in the acute stage, and the flesh is ‘fevered,’ seize the entire carcase.

3. The foetid forms of mastitis, with unpleasant-smelling flesh, have been responsible for outbreaks of meat-poisoning. In such cases, therefore, the entire carcase should be seized.

4. In other cases, after removal of the diseased udder, the carcase should be judged on its own merits.

Nephritis.

Several varieties of nephritis may be encountered. The simplest classification, and one that will be sufficient for the purposes of meat inspection, is a division of nephritis into three forms—viz.: (1) Parenchymatous, (2) interstitial, (3) suppurative.

Parenchymatous Nephritis includes cases in which the primary, most extensive, and most conspicuous lesions are in the tubular epithelium. This condition may be acute or chronic.

Acute parenchymatous nephritis is rarely seen in abattoirs, except in pigs suffering from swine erysipelas.

Causes.—Bacteria in the kidneys, bacterial toxins, and large doses of irritant drugs, such as cantharides or turpentine.

Naked-Eye Appearance of the Kidney.—Usually both kidneys are affected. There is an increase in size and weight of the kidney, with a consequently tense capsule, which, however, strips off easily. On section, most of the increase in size is found to be cortical, the cortex presenting a mottled cut surface, and frequently small hæmorrhages.

Microscopically.—The tubular epithelium is in a condition of cloudy swelling, is desquamating, proliferating, and in places quite absent. There are small hæmorrhages between the tubes and into the glomerular capsules. The cortical vessels and the glomeruli are congested. There are often slight interstitial changes and migrations of leucocytes between the tubes.

Chronic parenchymatous nephritis frequently, but not always, results from an acute attack.

Naked - Eye Appearance.—Usually both kidneys are affected. There is an increase in size and weight. The kidney is paler than normal, with a tense capsule that strips easily. Most of the increase in size is cortical, and the cortex on section is often in appearance dirty, or mottled yellowish-grey, or red. The medulla is dark and congested.

Microscopically.—The tubular epithelium is desquamating and undergoing fatty degeneration. Epithelial casts may be found in many of the tubes. There are usually some interstitial changes, in the form of new connective-tissue formation.

Judgment.—Many more kidneys reach the market in a state of parenchymatous nephritis than are seized for that condition, owing to the difficulty experienced in detecting the diseased state during an ordinary routine meat inspection. The majority are observed only because attention is in some way attracted to the kidneys by symptoms observed during life. If discovered, the kidneys should be seized, and the rest of the carcass dealt with according to the cause of the condition. If the nephritis is a complication of swine erysipelas, the whole carcass should, of course, be seized; if due to turpentine, cantharides, or other irritant drugs, complete seizure of the carcass depends on the odour and appearance of the flesh. The kidneys themselves should in any case be seized.

Interstitial Nephritis embraces those cases in which the histological changes are principally intertubular or along the course of the cortical bloodvessels. The epithelium of the tubes also always shows some changes.

Interstitial nephritis may be acute or chronic.

Acute interstitial nephritis is mainly observed in pigs. The naked-eye appearance of the kidney resembles closely that of the acute parenchymatous form, but the capsule does not strip so easily.

Chronic interstitial nephritis is most commonly observed in cows. Usually both kidneys are affected. Both, also, are smaller (maybe one-third the normal size), from the shrinking of the cortex. The capsule is adherent, and when stripped off brings away with it pieces of attached cortex, leaving a ragged, uneven, nodular kidney surface. Cortical cysts may frequently be seen on the surface of the kidney. On section, the kidney cuts harder, shows strands of connective tissue, and often a few more cortical cysts are found.

Microscopically.—Strands of inflammatory tissue can be seen running through the cortex to the capsule, and enclosing the disappearing remnants of the original kidney structure. It is the contraction of this 'scar tissue' that makes the kidney smaller than normal, and the kidney surface nodular. The 'scar tissue,' being attached to the capsule, renders this adherent. The cortical cysts are portions of the tubes, distended with urine.

Judgment.—As in the parenchymatous form, always seize the kidneys.

Suppurative Nephritis includes all conditions of the kidney in which suppuration is found as the result of pyogenic bacteria reaching that organ. The recognition of two distinct forms will be sufficient for the purposes of this work.

Pyæmic (embolic) nephritis is caused by pyogenic organisms carried in the blood, being arrested in the kidneys, where they form abscesses. This condition is only a part of pyæmia, as other organs will be simultaneously affected.

Naked-Eye Appearance.—Both kidneys are usually involved; each is enlarged, and its capsule tense, but easily stripped off. Many small abscesses are then visible on the surface of the kidney, and on section the cortex is found to be congested and studded with innumerable small abscesses, each surrounded by a small red zone.

The size of the abscesses varies inversely as their number, but, the condition being rapidly fatal, they are seldom larger than a pin's head. Small hæmorrhages may also be visible in the cortex.

Judgment.—Seize the entire carcase as in pyæmia (*q.v.*).

Purulent pyelo-nephritis is due to the invasion of the kidney with pyogenic organisms conveyed by the ureters. It is therefore associated with cystitis, which in the cow is frequently secondary to septic metritis.

This condition is most frequently met with in the cow.

Naked-Eye Appearance.—Usually both kidneys are affected; occasionally only one. The kidney is enlarged, and on section a few abscesses of large size will be found

in the medulla of the kidney, and occasionally in the cortex. The pelvis of the kidney usually contains pus. The abscesses are always few in number, large, and show a preference for the medullary portion of the kidney.

Examination of the ureters, bladder, and uterus, usually reveals the fact that these are in a state of suppurative inflammation.

Judgment.—If the case be recent, with but slight pus formation, it is sufficient to condemn the affected organs only. If old-standing, and so in an advanced stage of suppuration, there has probably been prolonged absorption of bacterial poisons, and ingestion of the meat may produce symptoms of meat-poisoning. The degree of the disease that calls for complete seizure of the carcass cannot be defined, but must be left to the discretion of the inspector. If in doubt, he should seize the entire carcass.

Pleurisy (Pleuritis, or Inflammation of the Pleura).

Pleurisy is usually due to bacteria in the pleural sac or in the membrane itself. Many different species of bacteria can produce pleuritis, and they may invade the pleura by various routes: (1) By extension from a pneumonic or lymphatic lesion in the chest; (2) by means of the blood-stream; (3) by the lymphatics communicating through the diaphragm with an infected peritoneal cavity; (4) by a perforating wound of the chest wall, or by rupture of the cesophagus.

Pleurisy may be acute, subacute, or chronic, in accordance with the various causal organisms. It may affect the whole of the pleura, or only a part of it, such as that covering either the diaphragm (skirt), a previously diseased lymphatic gland, an abscess, or an area of pneumonia.

Acute Pleurisy is usually streptococcal in origin. The first stages are seldom seen, but in them the pleural endothelium is dry, loses its lustre, and becomes dull and opaque. Following on this, an inflammatory exudate begins to escape into the pleural sac. The endothelium now

becomes swollen, and some of the cells are detached with the escaping fluid. The quantity of fluid varies so greatly that it may be sufficient to cause asphyxia by compression of the lungs, or may hardly be perceptible. The fluid is usually turbid from the presence of fibrin flakes, white corpuscles, and endothelial cells. Sometimes it is blood-stained, at other times purulent (empyema). Very frequently a more or less continuous layer of whitish or yellowish-white fibrin is deposited on the pleural surface, and coarse strings and lumps of fibrin may be found floating in the liquid. Putridity of the pleural effusion is not common, but occurs after perforating wounds of the chest wall or rupture of the œsophagus. The effusion is then foul, thick, and cream-like.

In cases that recover, the two fibrin-coated pleural surfaces unite, and permanent adhesions result. (See Pleurisy, under Tuberculosis).

Judgment.—The carcase may have to be condemned on account of the ‘fevered’ condition of the flesh. In chronic cases the flesh may be of good appearance, but all affected parts should be removed before the rest of the carcase is passed. It may even be necessary to ‘strip’ the pleura. If the condition has been purulent, the flesh is probably dark, flaccid, and greasy, in which case the entire carcase should be seized.

Peritonitis (Inflammation of the Peritoneum).

With the exception of the tuberculous form, peritonitis is usually septic, and in cows is frequently secondary to a septic metritis. As in pleurisy, bacteria are the usual, if not the sole, cause of peritonitis, and they invade the peritoneum in various ways: (1) By rupture of the stomach or bowel, or a perforating wound of the abdominal wall; (2) by extension through the wall of the stomach or bowel; (3) by means of the blood-stream; (4) by means of the lymphatics from a preceding pleurisy or metritis.

The appearance is similar to that of a purulent pleurisy. There is in the peritoneal cavity a foul-smelling, thickish

fluid with flakes of lymph. Recent fibrin deposits will be found matting various portions of the bowel together.

Judgment.—As the disease is usually fatal, the bad appearance of the flesh and the risk of meat-poisoning justify the seizure of the entire carcase.

Pneumonia (Inflammation of the Lungs).

Three main forms of pneumonia are usually recognized—viz. : (1) Croupous, (2) catarrhal, (3) interstitial.

Croupous or Lobar Pneumonia.—In this form, extensive areas of the lung, such as a lobe or more than one lobe, are affected. The cause is almost invariably animal parasites or bacteria, usually the latter. For convenience of description it is usual to divide the course of croupous pneumonia into three stages. It should be remembered, however, that these three stages are not well defined, but overlap.

(a) *First Stage (Stage of Congestion).*—Pneumonia is rarely if ever fatal during this stage.

Naked-Eye Appearance.—The affected lobe or lobes are dark red in colour, are seen to be voluminous when the chest is opened, and are less resilient than normal. On section, the affected parts are abnormally moist, and a large amount of blood escapes from the cut surface.

Microscopically.—The alveolar capillaries are injected with blood, and in places a little exudate may have escaped into the alveoli. The alveolar epithelium is swollen, and in some parts already desquamating.

(b) *Second Stage (Stage of Red Hepatization)*—*Naked-Eye Appearance.*—On opening the chest, the affected lobes do not collapse, having become solid in a condition of congestive distension. They project above the level of the normal adjacent lung, are airless and do not crepitate, but feel firm and liver-like. The cut surface is dark red and has a granular appearance. Being airless, a piece of the affected lobe sinks in water.

Microscopically.—The alveoli are occupied by inflammatory exudate, which has effused from the still engorged alveolar capillaries. Owing to the formation of fibrin in it,

this exudate, however, is now solid. The fibrin can be seen in the form of fine hyaline threads, which are entangling red and white blood-corpuscles and some shed epithelial cells, and are completely filling the alveolar space.

(c) *Third Stage (Stage of Grey Hepatization)—Naked-Eye Appearance.*—The affected area is not so firm as in the second stage, but is both airless and non-crepitant, and still sinks in water. The cut surface is greyish-red or greyish-yellow, and from it a granular material (degenerated exudate) can be obtained by gentle scraping.

Microscopically.—The inflammatory exudate is undergoing degeneration (fatty and mucoid), and no longer completely fills the alveoli. Instead of the hyaline threads, the alveoli contain a granular material mixed with leucocytes and shed epithelium. The pneumonia is undergoing resolution, the degenerated exudate being partly removed by the leucocytes, and partly by expectoration.

Catarrhal Pneumonia (Lobular Pneumonia or Broncho-Pneumonia).—In this form the pneumonic areas are limited to lobules. Large portions of lung may, however, be affected, owing to the contiguity of a number of lobules independently attacked. The causal agent may be animal parasites, bacteria, or inhaled foreign bodies.

Naked-Eye Appearance.—There is no constancy as to position or extent of lesion, but the extent of each patch corresponds in outline with that of one lobule of the lung. The affected area is solid, and projects above the level of the healthy lung tissue. It is greyish-pink or greyish-yellow, and on squeezing the cut surface a thick opaque material (catarrhal exudate) is expressed from the smaller bronchi.

Microscopically.—The alveoli are filled with epithelioid cells, and there is little or no fibrin formation. The epithelial cells of the alveolar walls are large, round, and proliferating.

The majority of cases seen in an abattoir are due to parasites (strongyles, *q.v.*).

Chronic Interstitial Pneumonia (Pulmonary Cirrhosis or Fibroid Induration of the Lung).—This is a chronic inflammation of the lung, leading to the formation of new fibrous tissue. Only portions of the lung are affected, never the whole of it.

Naked-Eye Appearance.—The affected part is firm, tough, and non-crepitant. The cut surface shows strands of connective tissue, enclosing the disappearing remnants of lung tissue, areas of necrosis, or dilated bronchioles (bronchiectasis).

In sheep the *Strongylus rufescens* is a common cause of this disease, which may affect as much as half one lung. The affected part is pale, dirty white, firm, and non-crepitant. Other worms that are an occasional cause are the *Strongylus filaria* and *Strongylus capillaris* (see Strongyles).

Judgment.—1. In the case of a pneumonia that is part of, or only a symptom of, a general disease, the entire carcase should be seized (*e.g.*, swine plague, pyæmia, or septicæmia).

2. In the early stages of a simple pneumonia (whether parasitic or bacterial) associated with a high temperature, the flesh is usually ‘fevered,’ and for that reason the entire carcase may require seizing.

3. In the later stages of a simple pneumonia, or in chronic induration of the lung, seizure of the affected organs is all that is needed, provided that neither is the carcase emaciated nor the flesh ‘fevered.’

CHAPTER VIII

Some diseased conditions of the more important organs: Bones—Heart—Kidneys—Liver—Lungs—Lymphatic glands—Œsophagus—Peritoneum—Pleura—Skin—Subcutis—Stomach and intestines—Tongue—Udder—Uterus. Injuries.

Bones.

Actinomycosis is frequent in cattle, and usually attacks the tongue or lower jaw. On the lower jaw the disease leads to a destructive osteitis, accompanied by actual suppuration. The teeth become loose and fall out. The soft textures around become involved and break down, allowing the escape of thick yellow pus, containing numerous characteristic granules. Around the central mass of breaking-down tissue spongy bone is developed, and, outside this, new hard bone may be deposited, so that a marked increase in the size of the jaw occurs.

Fractures.—As the result of violence any bone in the body may be fractured; fractures are, however, most common in the bones of the limbs, pelvis, and ribs. In judging carcases with recent fractures, the flesh adjacent to the fractures, being usually infiltrated with blood, requires seizing; otherwise, unless the injured part is septic, the remainder of the carcase is marketable. Old fractures are of no sanitary importance.

Osteomalacia is essentially a disease of old animals, and in the human subject is closely associated with pregnancy. It is not a common condition in the lower animals. In it the lime salts are absent, leaving only the matrix, so that the bones are soft, yielding, and easily cut with a knife. As a result of pressure, deformities are usual.

The spongy bone is rich in blood, dark-coloured, and

abnormally soft. The periosteum strips easily from the bone, whilst the bone-marrow is dark orange-red and abnormally fluid.

Judgment.—The meat should be judged on its own merits. If there is no accompanying emaciation, it may be passed, unless spoiled by fractures. If, however, the carcase is emaciated, it should for that reason alone be condemned.

Pre-sternal Calcification.—In cattle and sheep one occasionally encounters a condition that must not be mistaken for tuberculous changes. In the elastic pad of adipose tissue beneath the sternum, masses of fibrous tissue have been found, enclosing areas of a pure white, hard, calcified tissue. This condition is constantly found in overweighted fat cattle and sheep, and is believed to result from frequent crushing of, or pressure on, the parts when the animal lies down.

Rickets (Rachitis) is essentially a disease of young animals, and is rarely observed in food animals, except occasionally in pigs.

The changes are most marked in the long bones of the limbs and in the ribs, but the vertebræ are occasionally affected. The ends of the long bones are enlarged, and the shaft curved, and thickened on the concave side of the curvature. There is a great deficiency of lime salts, so that the bone appears to consist almost entirely of a spongy tissue, which is very vascular and cuts easily with a knife. The shaft is abnormally pliable, and the cartilage between the epiphyses and the shaft is abnormally thick.

Judgment.—Rickets in itself is not of great sanitary importance, and does not warrant seizure of the carcase. But it is a constitutional disease, usually accompanied by internal derangement, with anæmia, wasting, and watery, flabby flesh. In such cases the carcase must be condemned.

Tuberculosis.—Cattle and pigs are the food animals that occasionally develop tuberculous lesions in connection with their bones. Those affected are usually the dorsal vertebræ, the ribs, and the sternum.

In the vertebræ, the act of 'splitting' the carcase exposes such lesions, which appear in the early stages as soft, greyish granulations. Later, cavities develop containing broken-down caseous material. The lesions, by means of their granulation type of growth, may distend the bone, which appears as a mere shell enclosing the caseous débris. In the ribs the lesions present similar characters.

Heart.

Hæmorrhages are present in the form of petechial spots on the epicardium—a frequent accompaniment of general toxic and infectious disease.

For the changes resulting from inflammation, see Endocarditis and Pericarditis.

Kidneys.

Calculi.—Concretions of lime of varying size, up to that of a walnut, are frequently found in the pelvis of kidneys of cattle, and are usually accompanied by chronic interstitial nephritis. Calculi of themselves, if the kidney is otherwise healthy, do not require seizure of the organ.

In sheep one sometimes meets with a deposit of lime salts in the medulla of the kidney, which renders the organ gritty when cut, and unfit for human food.

Fatty Degeneration is occasionally met with apart from any attendant nephritis. Both kidneys are usually affected. The kidney is flabby, and the cut surface frequently feels greasy. The cortical layer is markedly pale, and in some cases almost dirty white, whilst the medulla is frequently congested.

Judgment.—Fatty degeneration is a diseased condition, and the kidneys should be condemned.

Infarcts are occasionally found in the kidneys. They are conical in form, with the base outward, so that on the surface they have a round appearance, but on section they appear triangular. Their colour in the early stages is red, becoming later greyish-yellow, and finally dirty white.

Under certain conditions suppuration may ensue, and result in the formation of an abscess.

Judgment.—Seize the affected organ.

Inflammation.—See Nephritis.

Malformation.—It is not uncommon to meet with absence of one kidney, with consequent hypertrophy and enlargement of the remaining organ. ‘Horseshoe’ kidney, or the fusion of the two organs across the middle line, is also occasionally seen. In these conditions the organ is usually healthy, and need not then be withheld from the market.

Tumours.—Sarcomata and carcinomata may occur either as primary or secondary (metastatic) growths. In the former condition the tumour may attain a size two or three times that of a normal kidney, and the growth is usually single. In metastatic growths there are commonly several, and these rarely attain a large size, as death occurs early..

Judgment.—In either case seize the kidney, and deal with the rest of the carcase on its merits.

Tuberculosis of the Kidney.—See Tuberculosis.

Liver.

Cirrhosis of the liver is a chronic inflammation of the intercellular liver tissue, and leads at first to an enlargement (hypertrophic cirrhosis) of the liver, but later to a decrease in volume (atrophic cirrhosis), owing to contraction of the ‘scar tissue.’

The principal exciting cause of this condition in the lower animals is the presence of liver flukes or other parasites in the bile-ducts, or some obstruction to the flow of bile in those ducts; but any irritant passing constantly through the liver is capable of acting as an exciting cause.

The liver is usually increased in weight to two or three times the normal (hypertrophic cirrhosis). The surface is usually smooth (hobnail liver is rare), but is occasionally irregular. The liver is pale, and the density and elasticity are in extreme cases increased almost to that of tendon. On cutting the organ, the knife experiences an unusual amount of resistance, and the cut surface shows abnormally

distinct lobulation. The intercellular connective tissue is pinkish-white, in contradistinction to the pronounced yellow colour of the normal elements it encloses.

In cirrhosis resulting from liver flukes, the connective tissue is excessively developed around the portal canal, and offshoots run from this tissue into the parenchyma of the liver. In such cases the distribution is frequently very unequal. The thickened bile-ducts are often partially occupied by thick bile, and their walls partially calcified.

Judgment.—The presence of flukes makes the liver repulsive, for which reason alone it should be seized; whilst the changes in, or destruction of, its normal elements render it unfit for human food.

Chronic Venous Congestion of the liver (nutmeg liver) is occasionally met, usually associated with disease of the heart or lungs.

The liver is enlarged, has a proportionate increase in its blood content, and is darker in colour than normal. On section, a large amount of blood wells from the exposed surface, and the hepatic veins appear large and distended. The lobulation of the liver is abnormally distinct, owing to a pronounced difference in colour between the central and peripheral parts of each lobule, the central part being dark from congestion, and the outer zone pale and frequently fatty.

Judgment.—If the condition be marked, the liver should be condemned.

Degeneration of the Liver.—Two conditions come under this heading—viz., fatty degeneration and amyloid degeneration.

Fatty degeneration of the liver is important from a sanitary point of view, as it is one of the early changes in infectious and toxic diseases. It is found occasionally in all the food animals, and, besides occurring in general diseases, it is one of the changes associated with poisoning from lead, arsenic, and phosphorus.

The liver is usually not enlarged; its firmness and elasticity are diminished, and it becomes doughy and easily

lacerated. Its colour is generally a pale yellow or a dirty white, and its lobulation indistinct.

Amyloid degeneration (lardaceous or bacon liver) is occasionally met in the slaughterhouse, and is usually associated with chronic tuberculosis.

The liver is enlarged and heavy, its edges are thickened, and its consistence increased, being firmer and more elastic than when healthy. The cut surface has a glazed, waxy appearance.

Necrosis of the Liver.—The necrosis bacillus is a facultative parasite—i.e., a dirt or soil organism (see Bacillary Necrosis). It is probably responsible for many of the sloughs occurring about the hoofs of the lower animals. In the adult ox, however, the most frequent site for its lesions is the liver.

This organ frequently is enlarged to several times its normal size, and on section is found to contain nodules of any size up to that of a walnut. These may be mistaken for neoplasms. When recent, these nodules are yellowish or dirty white, firm, and dry; the cut surface is smooth and tough, and may still show signs of the original lobulation. Each nodule is sharply defined, and surrounded by a red zone of inflamed liver tissue. The intervening normal liver tissue is usually stained yellowish-green, as in jaundice.

Later the necrotic nodules become encapsuled with tough connective tissue, whilst the centre may soften and become green or pus-like.

A similar condition is found in the livers of animals suffering from navel-ill.

Judgment.—Bacillary necrosis is a localized condition, and if the carcase is otherwise in good condition it is sufficient to seize the affected organ.

Parasites of the liver are frequently encountered in abattoirs, the commonest being the liver fluke, *Cysticercus tenuicollis*, *C. echinococcus*, and *Coccidia*. For a description of these parasites, see the chapter on Parasites. The only one of these conditions that will be considered here is that due to coccidia.

Coccidiosis or **Psorospermiosis** of the liver is a disease caused by a microscopic unicellular parasite, the *Coccidium oviforme*. The disease is commonest in the rabbit, affecting both the wild and domestic kinds. In the other domestic animals the disease is only occasionally found.

Naked-Eye Appearance of the Liver of a Rabbit.—The condition resembles somewhat that of tuberculosis—a disease unknown in wild-rabbits. The liver is enlarged, and studded with numerous white spots (dilated bile-ducts), varying in size up to that of a pea. The spots are irregular in shape (occasionally linear), and contain a thick milk-white liquid resembling pus.

Microscopically.—If a little of the milky liquid from a lesion be examined with a low power of the microscope, it will be found to consist of a fine granular material and a large number of regularly ovoid bodies (the coccidia). These coccidia resemble miniature birds' eggs, and have a double-contoured, flexible, transparent envelope enclosing a coarsely granular content, which either fills the envelope or is shrunk into the centre and surrounded by a structureless liquid.

Life-History of the Coccidia.—The foregoing description is the farthest stage of development reached in the animal body; but if the coccidia escape into the intestine, and are voided with the fæces on to moist earth, they undergo division, and each forms eight motile, comma-shaped structures (falciform corpuscles). These in turn, if swallowed with food, by a susceptible host, creep up the bile-duct, invade the epithelial lining of the ducts, and develop into the mature coccidia, producing the above-described changes in the liver.

From the number of coccidia present in an infected liver, it is evident that this parasite has the power of multiplication in the invaded organ, and this it effects both by sporulation and fission.

Microscopic Appearance of a Lesion.—A section through a lesion in the liver shows that, besides the destructive process in the bile-duct, resulting in abscess-like spots,

there is also a remarkable overgrowth of the mucous membrane. This overgrowth extends in all directions centrifugally from the bile-duct, branching and sub-branching, and each branch has for its axis a central continuation of the propria mucosæ. A cross-section of such a lesion has an appearance resembling that of an adenoma.

Judgment.—Nothing is as yet known about the transmissibility of these parasites to man. Owing to the structural changes in the infected liver, it should be seized, and the remainder of the carcase judged on its merits.

Tuberculosis of the Liver.—See Tuberculosis.

Lungs.

Atelectasis (Collapse of the Lung).—This condition may be either congenital or acquired.

Congenital atelectasis is the persistence in the foetal condition of certain areas of lung, and is usually seen in animals that were very weak at the time of birth, the respiratory efforts having been insufficient to inflate the whole of the lung. As one would expect, therefore, the parts usually affected are the apices and lower edges of the lung.

The affected areas are reddish in colour, non-crepitant, feel flabby like muscle, and are below the level of the surrounding lung. Never having contained air, a piece of lung in this condition sinks in water.

Acquired atelectasis may result from obstruction to the entry of air through the tube, or to pressure on the lung from without.

1. *Obstruction collapse* is rarely absent in cases of bronchitis and pneumonia, owing to mucus or inflammatory exudate blocking some small tube. Parasites and other foreign bodies may also have the same effect. In this condition small isolated areas are affected, most commonly the apices and lower edges. The collapsed area is reddish-purple in colour, non-crepitant, fleshy to the touch, below

the level of the surrounding lung, and in outline corresponds with lobules. A piece of such lung sinks in water.

2. *Pressure collapse* most commonly results from the accumulation of liquid in the pleural sac (either dropsical or inflammatory). Occasionally pressure by a tumour outside or between the lungs is the cause.

If due to fluid, it is the lower edges that are first affected, and the condition tends to spread upwards. The collapsed portion is dark red in colour, flabby, non-crepitant, and below the level of the adjoining normal lung. It should be remembered that, in cases due to pleurisy with effusion, the presence of a layer of fibrin on the pleura of the lung tends to hide this last condition.

Judgment.—If large areas are affected, the lung should be condemned, but small areas (unless parasitic in origin) may be passed.

Anthraxis is a condition in which the lungs become pigmented with carbon particles inhaled with the air. The course taken by these particles after inhalation is always towards the root of the lung and the lymphatic glands. A section of the lung shows the pigmentation around the bronchi and in the interlobular septa. Occasionally it is so extensive as to make the lymphatic glands coal-black. This condition is rare in domestic animals (except colliery ponies), but is occasionally found in calves. Other forms of atmospheric dust may be inhaled, and lead to calcareous deposits in the lung, but such conditions are rare.

Judgment.—Pigmentation may be so marked as to require seizure of the organs.

Aspiratory Conditions.—1. The aspiration of large foreign bodies into the lungs results in suppuration, the formation of cavities (gangrene), and death from putrid intoxication. Such conditions render the entire carcase unfit for human food.

2. Verminous pneumonia (see Pneumonia).

3. The aspiration of the stomach contents during the death struggles is a common occurrence amongst cattle,

and is most frequent in cattle slaughtered by the Jewish method, the cut ends of the œsophagus and windpipe being close together. This condition is easily recognized by making a cross-section through the lungs below the bifurcation of the windpipe. Lungs containing aspirated stomach contents are unfit for human food, and should be seized.

4. Aspiration of blood into the lungs at the time of slaughter occurs as a result of the Jewish method of slaughter, the last inspiratory efforts sucking into the cut end of the windpipe the blood flowing from the severed arteries of the neck. It is, however, common also in pigs; the temporary arrest of the flowing blood by means of digital pressure on the wound (in order that the collecting vessel may be changed) is sufficient to permit of blood entering a punctured windpipe.

Recognition.—Throughout the lung will be seen scattered red coloured lobuli, separated from one another by portions of normal lung. The latter appearance is a point of distinction between this condition and one due to hypostasis. To the touch, the coloured areas feel normal, and on section the bronchial tubes are filled with blood and foam.

Judgment.—If large quantities of blood appear to have been inhaled, the lungs should be seized, as decomposition in such cases sets in very rapidly. Small quantities, however, need not be considered, and the lungs should be passed.

Inflammation of the Lungs.—See Pneumonia and Pleurisy.

Moulds in the Lung.—*Aspergillus fumigatus* and *A. niger* very occasionally cause a broncho-pneumonia, simulating pulmonary tuberculosis. The bronchial glands are, however, unaffected, and the microscope reveals the mycelial formation of the apparent tubercles. Although not harmful when eaten, such lungs should be seized.

Parasites.—Various strongyles are to be found in the lungs of food animals, particularly in sheep (see Pneumonia). Occasionally one finds wandering liver flukes, echinococcus cysts, and cysts of the measles worm, etc.

Tumours.—The lungs, like other organs, are occasionally the site of neoplasms—*e.g.*, sarcomata, adenomata, and fibromata—and tumours resulting from tuberculosis, actinomycosis, and dried-up cysts are now and then found.

Lymphatic Glands.

A knowledge of the anatomy, physiology, and pathology, of the lymphatic glands is of the utmost importance to those dealing with the inspection of meat, for, by acting as a filter to the lymph stream, they, by the changes in their condition, give a good insight into the condition of the tributary area. It is important, therefore, to be able to recognize these changes, as they often make their appearance before the tributary area shows any pathological change.

Simple Inflammation.—Lymph glands react very readily, and are constantly inflamed when inflammatory processes are present in their tributary area. As a result of simple inflammation, the gland becomes enlarged, watery, and occasionally shows the presence of hæmorrhages. It is worthy of note that purulent processes rarely, if ever, appear in the lymph glands of domestic animals.

Tuberculous Infection of the Glands.—In the earliest stages this condition resembles that of simple inflammation, but the cut surface of the gland is greyish, and not white. The gland is enlarged, and its water content increased. Very soon minute tubercles of a grey colour can be distinguished in the gland tissue. At a later stage these tubercles become large and round, with cloudy caseating spots in their centres. In the final stages this caseation is replaced by calcification, and the gland may be dry, gritty, and mortar-like, or hard and stone-like. Meanwhile the glands have been steadily increasing in size, and may be as large as or larger than a man's fist. It is highly important for the meat inspector to look for, and be able to recognize, the early changes of tuberculosis in the glands. He should not have to rely on the presence of caseation or calcification. An examination with a lens of the cut surface of a

tuberculous gland will often reveal the presence of minute tubercles that might otherwise be unobserved. In suspected cases, a teased preparation of the gland should be examined with a low power of the microscope; the simple inflammatory condition will show a uniformly transparent field, but round cloudy areas will be noticed in a tuberculous gland (Ostertag).

Neoplasms.—The new growths to be found in lymphatic glands are lymphomata, sarcomata, and carcinomata. The first-named is the only one of the three that has its origin in the glands themselves; for carcinomatous and sarcomatous growth of the glands are usually secondary growths, the gland becoming invaded by metastasis.

Lymphomata are classified as hard or soft, according to their consistence. The soft variety is more frequently found in food animals. They are soft, semi-fluctuating, and of any size up to a melon, and may appear simultaneously in several glands about the body. They are usually associated with a certain change in the blood such as occurs in some constitutional condition—viz., a considerable increase in the number of white corpuscles (see Leucocythæmia). Lymphomatous growths are metastatic in nature, though not in origin, and secondary growths may be expected in other organs (liver, spleen, and kidneys).

Judgment.—On account of the pallor and the watery condition of the flesh, the carcase usually requires to be seized. Apart from these changes, judgment must depend upon the extent of the growth. If the enlarged glands are few in number, and the carcase otherwise healthy, removal of the affected parts is sufficient. If the invaded glands are numerous, or if the bone marrow or intramuscular glands are affected, the entire carcase should be condemned.

For Sarcomata and Carcinomata, see the chapter on Neoplasms.

Œsophagus.

Rupture of the Œsophagus occasionally occurs in cattle that are fed on unsliced roots, a portion of the root becoming impacted in the œsophagus. An attempt is made by means of a probang to force the obstructing body onwards, and often results in rupture of the œsophageal wall. The most frequent site for the rupture is in the thoracic portion of the œsophagus. In the event of such an accident, the animal is, or should be, promptly slaughtered.

If slaughter, however, has been delayed, gases from the rumen escape through the torn œsophagus, and may cause emphysema of the subcutaneous tissue about the neck. The flesh becomes soft, flabby, and watery, with a dirty red colour and an aromatic or sour odour resembling turnips. Small quantities of food may be found in the pleural cavity, accompanied by a septic pleurisy.

Judgment.—If slaughter was prompt, the carcase shows no changes resulting from the rupture, and on that account may be passed. If, however, slaughter was postponed till the above-mentioned changes have appeared, the carcase should be condemned.

The **Mucous Membrane** of the œsophagus is occasionally the seat of papillomatous or warty growths in cattle, of the œsophageal thread-worm in cattle and sheep, and of the larvæ of the *Œstrus bovis* in cattle; whilst goats, horses, and sheep, occasionally develop sarcosporidia in the mucous membrane.

Judgment.—These conditions require seizure of the œsophagus only.

Peritoneum.

Inflammation (see Peritonitis).—This condition is closely associated with alterations in the intestinal and urino-genital tracts, or injuries to the abdominal wall. In cattle the condition most commonly associated with it is septic metritis, but perforation of an intestinal ulcer and traumatic peritonitis are also frequent causes.

Mesenteric Emphysema is a condition found occasionally in pigs. It was first described by Maier in 1825. It is usually the mesentery of the small intestine that is affected. Along the attachment of the mesentery to the bowel a fringe of grape-like vesicles is formed, each being a distinct bubble, transparent and tightly distended with gas. This condition may reach and involve the mesenteric glands, which then acquire a sponge-like appearance. It does not appear ever to spread beyond the glands (Ostertag).

It seems, from observations by Motz and others, that this condition most frequently occurs in pigs fed on dairy-waste products. Its significance and pathology, however, are still unexplained.

Judgment.—It occurs in pigs perfectly healthy, with the exception of the bowel, which is spoilt. It is sufficient to seize the affected bowel.

Multiple Calcification of the peritoneum closely resembles tuberculosis of that membrane, and is occasionally present in cattle. One finds scattered over the surface of the peritoneum a few, or maybe innumerable, flat concretions, about the size of a pin's head. They are white in colour, and consist of lime salts. The flat form, the absence of caseation, and the normal condition of the corresponding lymph glands, should distinguish this condition from that of tuberculosis with grape formation, which is somewhat similar in appearance.

Judgment.—The condition is of no sanitary importance, and removal of the affected membrane in extensive cases is all that is required.

Parasites.—Positions between the layers of the omentum and mesentery and under the parietal peritoneum are favourite sites for the development of cysticerci. The two cysts that are commonly found are those of the *Cysticercus echinococcus* and *C. tenuicollis*, for a description of which see the chapter on Parasites.

Pleura.

Inflammation.—See Pleurisy.

Parasites in the pleura are far from common. A condition simulating that of tuberculosis, but due to the development of echinococcus cysts, has been described by Ostertag. The condition was observed in pigs—*i.e.*, numerous small cysts developed in clumps along the intercostal spaces between the pleura and the intercostal muscles.

Judgment.—The *Tænia echinococcus* is not transmissible to man, so that removal of the affected pleura, and with it the cysts, is all that is required.

Neoplasms.—Along the course of, and growing from the intercostal nerves one occasionally finds numerous small growths (myxofibromata), which may be mistaken for tuberculous changes or echinococci. The growths are outside the pleura, are firm, usually about the size of a pea, and envelop the nerve like a ring. Occasionally they may attain the size of a walnut. On section they show a firm fibrous matrix, containing a more or less clear mucoid material, but caseation is never present.

Judgment.—These are of no sanitary importance, and only require removal.

Skin.

Bruises may be slight, with consequent discoloration, and extravasation of blood; or they may be severe, resulting in necrosis or in a large collection of blood (hæmatoma); or they may suppurate and an abscess form.

Wounds may be incised (clean-cut edges), lacerated (jagged or torn edges), punctured, or contused (bruised, lacerated edges).

Judgment.—Any of the foregoing injuries, if of slight degree and not accompanied by septic changes, are unimportant. But if extensive, multiple, or undergoing marked suppuration, seizure of the injured part, limb, or even of the entire carcase, is indicated.

Discoloration of the skin may be due to hæmorrhage, inflammation, death-marks, or pigmentation.

1. In hæmorrhages there is blood in the interstices of the tissues, but often no swelling, and the discoloration is not dispersed by pressure of the finger.

2. In inflammation there is congestion, through the accumulation of blood in the smaller vessels; and swelling, from the escape of exudate from those vessels into the surrounding tissues.

3. Death-marks are bluish-red, and result from the stagnation of the blood in the dilated capillaries. Pressure of the finger will disperse this collection of blood, with consequent temporary disappearance of the discoloration.

4. Pigmentation of the skin of hogs and sows is occasionally seen. Numerous irregular, branching black spots may be found in the subcutaneous fat of the belly, resulting from the deposit of the hair pigment (see Melanosis). In spite of the pigment failing to give an iron reaction, which it should do if blood were present, Ostertag is of opinion that the pigmentation is the result of frequent bruising.

Judgment.—If pigmentation is extensive, the condition becomes repulsive, and the affected parts may for this reason be seized.

Multiple Dermoid Cysts (Granular Eruption of Zschokke).—Roundish tubercles, varying in size up to that of a pea, are occasionally found in large numbers in the skin of the pig. The tubercles are dark, firm, and shiny, contain a dark oily paste, and have usually a hair growing from the centre. Newly-formed tubercles are, however, nearly white. These growths are most commonly observed about the croup and sides of the breast.

Olt has described a coccidium (*Coccidium fuscum*) which he found in the cysts, and which he considers the causal agent.

Judgment.—It is a harmless local affection, and requires only removal of affected areas of the skin.

Sooty Mange of young pigs is an accompaniment of some

internal disease, frequently tuberculosis. An eruption of vesicles forms on the skin, the vesicles suppurate and burst, leaving dirty sores covered with scabs.

Urticaria (Nettle-rash) is a condition in which patches of skin become raised and discoloured, owing to the collection of a blood-tinged fluid in the subcutaneous tissues. The animal most commonly affected is the pig. Urticarial skin changes occur in swine erysipelas, but that disease is very rare in England. The fact that the urticarial rash appears most commonly after the ingestion of fermenting foods, lasts only a day or so, and is removed by saline purgatives, suggests that the origin of the condition is frequently in the alimentary tract.

Lesions.—Red-coloured patches of skin appear about the shoulder, back, and hips. These are irregularly circular, often rhombic, and vary in size from a threepenny-bit to a penny-piece, whilst by coalescence they may cover large areas. At first the patches are dark red in colour, but this soon fades and the affected areas become livid. It is a noticeable fact that this fading in colour starts in the superficial layers of the skin first. Occasionally the condition is complicated by the formation of pustules on the urticarial patches.

During life the only symptoms exhibited are general depression, loss of appetite, and diarrhoea.

Judgment.—Neither scalding nor scraping the skin removes the discoloured patches; and although the condition is harmless to man, such a carcass should not be passed as marketable until the affected areas have been removed. This frequently means condemning the whole skin, and thus spoiling the market value of the carcass.

Pigs in this condition should have slaughter postponed a few days, and in the meanwhile be dosed with saline purgatives.

Subcutis.

Œdema.—What is usually understood by the term 'œdema' is the collection of a clear serous fluid in the subcutaneous tissue, with a consequent boggy swelling of the parts. The

portions of the body that usually give the first sign of œdema are the low-lying ones, such as the limbs, and lower parts of the chest and abdomen. The *cause* is, frequently, a diseased condition of the heart, kidneys, or liver. Localized areas of œdema are to be found around the larvæ (warbles) growing in the subcutis of cattle (see Warbles). Injuries or lesions affecting the urinary tract occasionally lead to the extravasation of urine into the subcutaneous tissue. Such a condition, however, should not be mistaken for œdema, owing to its characteristic uriniferous odour and the tendency for the overlying skin to come away in sloughs.

Stomach and Intestines.

Inflammation.—Inflammatory changes may be met with in all stages, from that of a simple catarrh, with slight swelling and congestion of the mucous membrane, to that of an intense fiery inflammation, with the formation of fibrinous deposits or ulceration. The object of an inspection is to distinguish the simple non-febrile catarrhal changes of no importance, from the septic changes accompanied by high fever and general ill-health (met with in young calves), and the inflammatory changes that are part of a general disease, such as malignant catarrh, swine fever, cattle plague, etc. It should also be remembered that a more or less localized inflammatory condition will be found in cases of torsion of the bowel, intussusception, strangulated hernia, etc. In all of these, an emergency slaughter is indicated, for the meat will then be perfectly good. These conditions, on the other hand, might lead to a perforative general peritonitis, and thereby render the meat unfit for human food, if slaughter were deferred.

Judgment will depend on the condition of the meat (whether 'fevered' or not), the cause of the inflammation, and the presence or absence of an accompanying perforative peritonitis.

Peptic Ulcer of the Stomach is of frequent occurrence in the abomasum (fourth stomach, or 'bible') of calves. There

may be only one such ulcer or several of varying sizes. The ulcers are usually round or slightly elongated, with sharp, clean-cut borders. They frequently lead to death by perforating through into the peritoneal cavity and causing general peritonitis.

Judgment.—If the carcase is in good condition, the presence of peptic ulcers should not exclude it from the market. It is necessary to condemn only the stomach itself. If perforation has occurred, with consequent general peritonitis, the whole carcase requires seizing.

Parasites (see chapter on Parasites).—Numerous parasites of all kinds (ascarides, tapeworms, and strongyles) may be found in the stomach and intestines of all the food animals. If the carcase is in good condition and not emaciated, their presence is of no sanitary importance.

Large numbers, however, result in emaciation, and occasionally intestinal obstruction.

Occasionally a migrating strongyle will block the common bile-duct and cause jaundice, and so render the carcase unfit for the market.

Mention may here be made of a condition first described by Drechsler, in which a small nematode was found encapsuled in a small round nodule in the submucosa of the intestine of cattle and sheep. The nodules are circular, slightly flattened, about the size of a common pin's head, and have green-coloured, mortar-like, crumbly contents. The largest tubercles can be seen from outside before the intestines are cleaned. They are sometimes so numerous as to appear to have been sprinkled on to the mucous membrane.

Judgment.—If in large numbers, these nematodes of Drechsler render the intestine unfit for human food, and their use for sausage-casing should be prohibited. If the number is small, the affected part should be removed. The present state of our knowledge leads us to believe these nodules are not pathogenic to man.

Intestinal Coccidiosis (see Coccidiosis of the Liver) is met with in many of the food animals. The responsible

parasite is the *Coccidium perforans*. As in the case of coccidiosis of the liver, it is the epithelial cells that are affected; it affects not only the lining epithelium of the bowel (including the villi), but also that of Lieberkühn's glands. There is a large destruction of the epithelium, but at the same time an accompanying proliferation or overgrowth.

The rabbit is the food animal in England most commonly affected, but fowls and young artificially-reared pheasants are occasionally subject to epidemic outbreaks. The same condition has also been described in the large intestine of bovines. In the sheep the small intestine is the main site, and in it the parasite results in the formation of small cone-shaped, rose-coloured, wart-like growths about the size of an oat grain. These consist of a central strand of branching connective tissue, covered with distorted overgrown epithelial cells. This condition in sheep is practically unknown in England, but is very rife in South Africa.

Tongue.

Inflammation.—This may result from trauma, or from chemical irritants taken in with the food or as drugs, or from specific poisons of certain diseases (foot and mouth, aphtha, cattle plague, etc.). The condition varies, according to the cause, from a superficial inflammation of a mild character to a severe condition with the formation of a false membrane or extensive ulceration. In the severe forms there is often marked cedema and enlargement of the organ.

Judgment.—If the inflammation is the result of trauma or caustics, provided death did not result and there were no septic complications of a severe kind, only the affected parts need be condemned, the remainder of the carcass usually being healthy. Inflammation occurring as part of a specific disease requires judging according to the cause.

Wooden Tongue.—This term is sometimes applied to the indurated tongue observed in actinomycosis of that organ (see Actinomycosis).

Udder.

The udder may be observed in a state of lactation, when it is large, flabby, and hangs from the abdominal wall, or it may be in a state of quiescence ('dried off') after its period of activity. It is then small, surrounded and penetrated with fat, and is often difficult to distinguish from the adipose tissue.

Actinomycosis of the udder is a rare condition in cattle and sheep, but not infrequent in the sow. It may take the form of a diffuse induration throughout the gland, or of isolated tumours. In each case, on section, small collections of the characteristic pus, with its granular colonies, will be found.

Botryomycosis.—When this condition affects the udder, numerous hard, knotty swellings form in the gland, become adherent to the skin, and frequently burst outwardly, discharging a little pus containing the sand-like granules.

Inflammation.—See Mastitis.

Tuberculosis of the Udder.—See Tuberculosis.

Neoplasms.—Among the food animals, neoplasms of any importance in the udder are rare. In cattle, warts (papillomata) are occasionally found in the lumen of the teats, and 'whortleberries' (papillomata) are common on the skin covering the udder.

Uterus.

Inflammation (see Metritis) of the uterus is of great sanitary importance to the meat inspector, as it may render the entire carcase unfit for human food, and has been recorded as the cause of meat-poisoning. From this point of view, the most dangerous condition is a septic inflammation following on a retained 'after-birth' or a 'mummified' or dead fœtus. In such cases the carcase is usually 'fevered,' and therefore condemned; but even without a fevered carcase, the possible danger to the consumer should always be in the inspector's mind.

Laceration of the uterus is important only if it has caused a general peritonitis, and the carcase should be judged accordingly.

Tuberculosis of the uterus may take the form of ulcers of the lining mucous membrane, as a result of direct infection from the outer world (this is, however, a rare form) ; or the more frequent form is that caused by the disease spreading from a chronic tubercular peritonitis. In this case the wall of the uterus is much thickened and indurated, and contains numerous caseating or calcified tuberculous foci scattered about. In a 'generalized' tuberculosis, numerous small scattered tubercles may be found under the lining mucous membrane, and these may burst, and leave ulcers discharging into the uterine cavity.

Judgment.—See Tuberculosis.

Injuries.

Food animals occasionally get damaged during transit. Trivial wounds which are not septic require no mentioning, but occasionally a fractured limb, etc., or extensive bruising, is found. The muscles around a fractured bone are usually lacerated and infiltrated with extravasated blood. The application of irritants, as mustard, cantharides, etc., results in œdema and swelling of the subcutaneous tissues of the affected area, and often marked congestion.

Judgment.—If slaughtered after a severe injury, the flesh is usually 'fevered' in appearance, sets badly, and has a poor keeping quality. Under these circumstances it should be considered unfit for the market. If the effects of the injury are purely local, seizure of the repulsive parts is all that is required. The application of severe irritants may necessitate the seizure of large portions of the carcase, whilst it should be remembered that inflammatory diseases are frequently the cause of such applications, and they should be sought for and the carcase judged accordingly.

CHAPTER IX

Certain of the more important parasites—Coccidia : (1) *C. oviforme* ; (2) *C. perforans*. Cysts of tapeworms : *Cysticercus bovis* (measly beef)—*Cysticercus cellulosæ* (measly pork)—*Cœnurus cerebralis*—*Echinococci* : (1) *E. veterinorum* ; (2) *E. multilocularis*—*Cysticercus pisiformis*—*Cœnurus serialis*—*Cysticercus tenuicollis*. Dipterous larvæ : *Æstrus bovis*—*Æstrus ovis*—Maggots. *Distomum hepaticum*—*Pentastoma tænioides*—Hair follicle mite of the pig. Round-worms : *Acanthocephali*—*Nematodes* : (1) *Ascarides* ; (2) Strongyles : *S. capillaris*, *S. contortus*, *S. convolutus*, *S. filaria*, *S. micrurus*, *S. paradoxus*, *S. rufescens* ; (3) *Trichina spiralis*. *Tænia* : *T. expansa*—*T. denticulata*—*T. alba*—*T. ovilla*. *Sarcosporidia* : Rainey's corpuscles—*Balbianæ*. Calcified parasites.

MANY of the organs of our food animals are so regularly infected with worms that the presence of these may be considered almost a normal condition—e.g., liver flukes in the liver ; indeed, there are only a few organs that can be said to be entirely free from the invasion of parasites. The number of parasites affecting the domestic animals is very large. Of these, some are harmless guests, whilst others cause extensive changes in the infected parts, and considerable constitutional disturbance to their host.

It is impracticable in a work of this extent to consider every possible parasite likely to be encountered, so that a few of most importance to the meat inspector have been selected.

Coccidia.

Coccidia are protozoa which invade epithelial cells. They are small oval, or round, structures which by means of their rapid growth and multiplication destroy the epithelial cells in which they are located. There are

two recognized and distinct types of coccidia that are of importance to the sanitarian :

1. *Coccidium Oviforme* (Leuckart).—This is an oval or egg-shaped body, consisting of a double outer membrane which encloses a coarsely granular protoplasm. This granular material fills at first the whole of the interior of the parasite, but soon becomes contracted into a globule, and the remaining space is then occupied by a clear transparent liquid. The main site of this parasite is the bile-ducts of the rabbit's liver (see Coccidiosis), but a similar condition has been described in the liver of man and pigs.

2. *Coccidium Perforans* (Leuckart).—This parasite is smaller and more nearly round than the *C. oviforme*, but is otherwise similar. It is found in large numbers in the intestinal epithelium of sheep, calves, and rabbits. Red dysentery of cattle is also probably due to this parasite, which in these animals infests the epithelium of the colon, and sets up a blood-stained diarrhoea.

Cysts of Tapeworms.

For the complete life-cycle of a tapeworm, two hosts of distinct species are required. In one host, the parasite exists in the mature form as the tapeworm, whilst in the other host it is in an immature or cystic condition. It is this immature form that we are at the present moment considering. The cyst is usually only two-thirds filled with a clear fluid, and contains the immature form of its particular tapeworm. Although it is generally believed that all tapeworms have a cystic stage, there are many in which this has not yet been discovered—*e.g.*, the tapeworms of horses and cattle. When the cyst is ingested by a susceptible host, the act of digestion in the stomach liberates the miniature worm (scolex). The scolex passes into the intestine, and there develops into the mature parasite or tapeworm. Its ripe ova are voided with the fæces; and if ingested by a susceptible host, they migrate from the intestine into some internal organ or tissue, and there develop into the cystic or immature form. Of all the

tapeworm cysts found in the domestic animals, three only are capable of developing into the mature tapeworm in the intestines of man. These are the *Cysticercus bovis*, *Cysticercus cellulosæ*, and the echinococcus cyst.

Cysticercus Bovis.—‘Measly beef’ is beef infected with the beef bladder-worm (*Cysticercus bovis* or *inermis*), this being the larval or cystic stage in the life-cycle of the *Tænia saginata* of man. The cyst appears like a spherical bladder, is grey in colour, but transparent, and made up of three layers. (1) The outer layer is an inflammatory connective tissue derived from the surrounding tissue. (2) The middle layer is the bladder-worm capsule. (3) The innermost layer is the parasite itself. This consists of a caudal bladder and a head and neck (scolex). The scolex is invaginated into the caudal bladder, and shows through the capsule (second layer) as a white spot, in size about that of a millet-seed, or as large, even, as a common pin’s head. Magnification of the scolex shows the head to have four suckers, but no hooks, whilst the neck is permeated with ‘calcareous corpuscles.’ These calcareous corpuscles in the neck are held to be distinctive of the *Cysticercus bovis*,

The ‘measle-worm,’ as the cyst is often called, is usually found in the interfibrillar connective tissue of the muscles, but may be found also in the lungs, liver, or brain. The ‘worm’ may be of any size up to that of a pea or small bean, according to its age and development. It may become fibrous, suppurate, or caseate and calcify, at any stage in its development. When ingested by a susceptible host, it takes four or five months to develop into a fully-grown, mature tapeworm (*Tænia saginata*). Measly beef is most frequently found in Switzerland; but Germany, France, and America, are far from free. In Great Britain the parasite is not common.

Occurrence in the Body.—Statistics in Germany have shown that by far the larger proportion of affected cattle had only the masticatory muscles affected, the next most common muscular sites being the heart, tongue, muscles of the neck, diaphragm, and intercostals. On exceptional

occasions 'measle-worms' have been found in the lymph glands, lungs, liver, brain, and œsophagus.

Diagnosis.—An ordinary teased preparation of the 'measle-worm' will, under a slight magnification, show the 'calcareous corpuscles' in the neck, the four suckers on the head, and the absence of hooks. Living cysticerci, when warmed to 30° or 40° C. under the microscope, show active movements of the head and neck, suckers and rostellum, while dead cysticerci remain motionless.

Resisting Powers of the 'Measle-Worm'.—*To Heat.*—Perroncito records that a temperature of 45° C. is sufficient to destroy the life of the 'measle-worm,' whilst Hertwig draws attention to the fact that at 65° C. the normally hard scolex is soft and tallow-like. Boiling measly beef, therefore, for two hours, in not too large pieces, renders the meat safe to eat; or meat boiled till a cross-section is uniformly grey in colour (this change occurs only after a temperature of 65° C. has been reached) has been sufficiently cooked for safety.

To Pickling.—Perroncito's investigations demonstrated that isolated cysticerci are killed within twenty-four hours, in a solution of common salt, whilst Ostertag states that common brine, if injected into the meat, or if the meat, cut into small pieces, be soaked in it, will destroy the life of the *Cysticercus bovis* in fourteen days.

To Cold.—According to Reissmann, in even large pieces of meat, exposure for four days at -10° C. is sufficient to render the meat harmless, and fit to eat.

Perroncito found that 'hanging' measly beef for three weeks is sufficient to kill the parasite. This was confirmed by subsequently feeding animals on the infected meat. So that measly beef that is meant to be eaten, is probably best treated by 'hanging' in the cold store for three weeks. In this country, however, where measly beef is far from common, it is better to destroy the carcase.

Judgment.—Measly beef is a dangerous food material, for from it develops the *Tænia saginata* of man. The entire carcase had therefore better be seized and destroyed.

Cysticercus Cellulosæ.—‘Measly pork’ is pork infected with the hog bladder-worm (*Cysticercus cellulosæ*), this being the larval or cystic stage in the life-cycle of the *Tania solium* of man. The hog bladder-worm is located in the connective tissue lying between adjacent muscle fibres. It is very similar in appearance to the *Cysticercus bovis*, but the cyst is more delicate and transparent, and shows the invaginated scolex more distinctly. The scolex is also provided, besides the four suckers, with a double circle of hooks (twenty-two to twenty-eight hooks in all), which are absent in that of the *Cysticercus bovis*. The *Cysticercus cellulosæ* varies in size from that of a pin’s head (three weeks’ development) to that of a large pea (eight weeks’ development). The fully-developed cyst is bean- or kidney-shaped, and the scolex is not completely invaginated, and may be seen as an opaque white speck.

The parasite is comparatively rare in Great Britain and Germany (Ostertag), but is of frequent occurrence in pigs in the eastern provinces of Prussia, in Servia, and in Bohemia.

The *Cysticercus cellulosæ* is occasionally found in sheep, and rarely develops in pigs over six months old. It may undergo coagulative necrosis, caseation and calcification, but not so commonly as does the *Cysticercus bovis*. The muscles and organs may then appear sprinkled with white calcareous granules.

Occurrence in the Body.—The usual seats are the abdominal muscles, the muscular portion of the diaphragm, the tongue, heart, masticatory muscles, intercostal and cervical muscles, and occasionally the lumbar and sternal muscles. In extensive invasions they may be found also in the brain, lymphatic glands, and the subcutaneous fat, but rarely in any visceral organ. Infestation of the muscles may be so severe that the cysts occupy more room than the muscle itself, which will then appear watery and reddish-grey.

Diagnosis.—During life pigs are examined by ‘throwing’ them, wedging open the jaws and drawing forward the

tongue, in order to palpate its base and feel for the cysticerci.

In preparations of the muscle, one can always, with the aid of the microscope, find the hooks, except in completely calcified cysts, and in such cases the situation between the muscle fibres, and the presence of the connective-tissue capsule, are very suggestive.

Powers of Resistance.—These are similar in measly pork to those of measly beef—i.e., both boiling and pickling render the meat harmless. The *Cysticercus cellulosæ*, however, requires a temperature of 49° C. to destroy it, and lives longer after the death of its host; for it has been found alive in pork that has been ‘hanging’ for five weeks. So that simply ‘hanging’ must not be considered sufficient to render ‘measly pork’ harmless. Boiled ‘measly pork,’ which cuts with a uniformly white surface, is to be considered harmless.

Judgment.—The entire carcass should be seized and destroyed. Eating measly pork infects man with the *Tænia solium*, and auto-infection with the *Cysticercus cellulosæ* is not uncommon. It is accounted for by ripe proglottides making their way back to the stomach, or by the sucking of fæces-soiled fingers.

In man, the cysts become located in vital organs, such as the brain and eyes, as well as in the muscles.

Cœnurus Cerebralis.—This is the cystic stage of a tapeworm of the dog (*Tænia cœnurus*), and is responsible for the condition known as ‘gid’ in sheep. It is not transmissible to man.

The cyst is found in the brain and spinal cord, and occasionally in other parts, of sheep and cattle. It is spherical or slightly elongated, and varies in size from that of a millet-seed to that of a walnut. The inner surface of the cyst wall is studded with numerous scolices (immature tapeworms).

Echinococci.—The echinococcus cyst is the cystic or larval stage of a small tapeworm (*Tænia echinococcus*), $\frac{1}{8}$ to $\frac{1}{4}$ inch long, which inhabits the small intestine of the dog.

There are two distinct forms in which echinococci may be found in food animals : the *Echinococcus polymorphus* s. *unilocularis* and the *Echinococcus multilocularis* s. *alveolaris*.

1. **Echinococcus Polymorphus** or **E. Veterinorum**.—When the ova of the *Tænia echinococcus* are taken in with the food, by a susceptible host, they give exit in the intestine to an embryo, which bores through the bowel wall and is transported, probably by the blood, to the organ in which it subsequently develops—usually the lungs in the case of cattle and sheep, and the liver in pigs. The parasite, having come to rest, starts developing, and produces a spherical, bladder-like, or cystic, structure, which may be no larger than a pea, or may eventually reach the size of a man's head. There may be a hundred or more such simple cysts in the organ invaded, and livers so infected have, in cattle, been recorded to weigh 1 hundredweight, and in pigs $\frac{1}{2}$ hundredweight; but these are exceptional weights. In the horse each cyst is rarely larger than a cherry.

Structure.—The bladder-like growth above referred to can be separated into two distinct parts : (1) The echinococcus proper ; (2) the organic or inflammatory capsule of connective tissue which surrounds it, and is the result of the reaction set up by the irritating presence of the echinococcus.

The echinococcus proper, on removal from its inflammatory capsule, becomes corrugated, or wrinkled. The cyst wall is thin, transparent, and of bluish-grey colour in the case of young cysts, but thick, opaque, and white, in old cysts. Up to eight weeks old the echinococcus is solid, but after this a cavity commences to form. The cyst proper may have one of three structures :

1. The cyst wall consists of a tough striated outer cuticle, which, if torn across and the edge magnified, shows a fine lamellation parallel to the surface, like the layers of an onion (this is considered to be diagnostic), and an internal parenchymatous membrane of finely granular structure, usually covered on its internal surface with numerous little white bodies the size of an ordinary pin's head. These are

the brood capsules, which commence forming after the fifth month, and are produced by a process of budding from the lining membrane. The microscope shows that the inner surface of the wall of the brood capsules is studded with scolices, or potential heads of new tapeworms. These, if eaten by a dog, will develop into *Tenia echinococci*, but are harmless to man. The embryo scolex is, roughly, pear-shaped, and attached, by a slight pedicle at one end, to the wall of the brood capsule; whilst the other end is free, and presents a central rostellum, encircled by hooklets and four suckers. The body of the scolex contains numerous oval refractile bodies (calcareous corpuscles). The hooklets are, roughly, like a miniature cat's claw, with a small handle on the

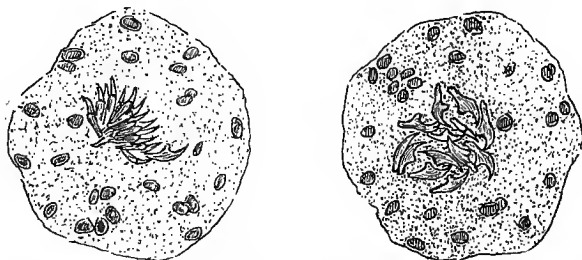


FIG. 21.—SCOLICES FROM AN ECHINOCOCCUS CYST, SHOWING HOOKLETS AND CALCAREOUS CORPUSCLES. $\times 325$.

concave side (Fig. 21). These hooklets are very resistive to disintegration, and are therefore of great diagnostic value in the case of degenerated cysts. The remainder of the cyst cavity contains a clear watery liquid under pressure, which spurts out when the cyst is punctured. This variety is the *Echinococcus cysticus fertilis*, and, though not the form most commonly met in food animals, is occasionally found in sheep, and more rarely still in pigs and cattle.

2. The variety most commonly met in food animals has the same lamellated outer cuticle, but the inner parenchymatous layer has a smooth inner surface, enclosing only a clear watery liquid, and being quite devoid of any brood

capsules. It is, in fact, a barren or sterile cyst, and contains no potential tapeworms (*Echinococcus cysticus sterilis*).

3. There is recorded in sheep a still rarer variety, which for the sake of completeness may be alluded to—the echinococcus with ‘daughter’ cysts. In this variety small cystic structures (the daughter cysts) will be found growing from the inner or parenchymatous membrane of the cyst proper (the mother cyst); and these daughter cysts may grow either into the echinococcus cyst cavity (*E. hydatidosus*), or outwardly away from the cavity (*E. granulosus*). The daughter cysts may in turn develop grand-daughter cysts, and these may be fertile or sterile.

Occurrence.—The *Echinococcus veterinorum* is frequently found in sheep, cattle, and pigs, but is not common in goats or horses. The organs most commonly affected are the lungs, liver, and spleen, but the heart, kidney, peritoneum, udder, bones, and muscles, are occasionally attacked. The brain and eye are also recorded as having been affected (Längrich). In cattle and sheep it is usually the lungs that are invaded, but in pigs the commonest site is the liver.

The Effect on the Host.—Apart from the organ invaded, the animal body shows no material change resulting from the presence of these cysts. Even when there has been an extensive invasion of the liver, the general condition of the animal is good. Extensive invasion of the lungs may, however, lead to dyspnoea; and if the heart is invaded syncope may ensue.

Changes in the Cyst.—The *Echinococcus veterinorum* may die, at any stage of its development, from a coagulative necrosis with consequent caseation and central calcification; or it may be destroyed by inflammation of its capsule and consequent absorption of its fluid contents. Disintegrated echinococci appear as cysts with yellowish or greenish contents, and are often caseous, purulent, and partly calcified. Such cysts may be mistaken for tuberculous lesions, but the presence of hooklets or shreds of lamellated membrane, with the absence of tubercle bacilli and no

change in the appearance of the adjoining lymphatic glands, should make the distinction easy.

2. *Echinococcus Multilocularis* s. *Alveolaris*.—This form of echinococcus in food animals is distinctly rare in this country, but is apparently far from rare in Germany. It is usually the liver that is invaded, but occasionally the parasite is encountered in the spleen, lungs, kidneys, lymph glands, and bones. It develops as a tumour-like growth of any size up to that of a cocoanut, is firm, and shows a partly calcified centre. The whole tumour is permeated with a framework of connective tissue which encloses numerous small cysts—caseous or otherwise, according to age—which have resulted from a process of exogenous budding from the original cyst wall. These echinococcus growths resemble somewhat the growths due to the actinomyces or botryomyces.

The growth, it has been suggested, represents the cystic stage of a tænia other than the *Tænia echinococcus*, and there are reasons for believing that this may be the case.

Judgment of Echinococci.—In food, the echinococcus cyst itself is not dangerous to man, but only to dogs. Although man is unable to act as the host of the *Tænia echinococcus*, he is frequently the host in which the echinococcus cyst develops, as the result of ingesting the ova of the *Tænia echinococcus*, his food in some way having become soiled with the ova voided with the fæces of a dog. It is for this reason that dogs are prohibited in slaughterhouses.

In a carcase containing echinococci cysts, the invaded organ should be seized and destroyed; but the remainder of the carcase, if it appear normal, may be allowed into the market.

Cysticercus Pisiformis.—This cyst is the size of, or a little larger than, a pea, and is found under the serous membranes, commonly between the layers of the mesenteries of rabbits and hares. It develops into the *Tænia serrata* of the dog, which is not found in cattle, sheep, or pigs, and is not transmissible to man.

Cœnurus Serialis.—The *Cœnurus serialis* is found in the

body cavity and nervous system of rabbits, and in the intestine of the dog it develops into the *Tænia serialis*. It is not transmissible to man.

Cysticercus Tenuicollis.—This cyst is frequently found in sheep, cattle, and pigs. It is the larval or cystic stage of the *Tænia marginata* of the dog, and is not transmissible to man. The cyst is about the size of a cherry or a walnut, and is found under the peritoneal covering of the liver, between the layers of the mesentery and omentum, and occasionally under the pleura. The young cyst causes a prominence or projection of the serous membrane covering it, but older and larger cysts are situated in a diverticulum of the serous membrane. When removed from its serous covering, it is easily recognized by the presence of a long corrugated neck, and by being two-thirds full of a clear liquid. After swallowing of the tapeworm ova by a sheep, four or five weeks are required for the cystic stage to become fully developed.

Dipterous Larvæ.

There are several species of the Diptera family that are parasitic in their larval stage upon and within the bodies of mammals. For the purpose of meat inspection, however, only three require consideration.

1. **Warbles (Bots).**—This, in many parts of the country, is a local term for the condition in which the larvæ of certain flies develop under the hides of cattle. The larvæ may be so numerous as to number 400 per square foot of hide; and individually they may cause swellings up to the size of a walnut to appear in the skin. In these swellings may be found the bots or maggots immersed in pus, which is exuding from a hole in the summit of the swelling.

Two 'warble-flies' are held responsible for this condition, both belonging to the group (Estridæ. They are (1) the *Hypoderma lineata* (Villiers), (2) the *Hypoderma bovis* (Degeer).

The warble varies slightly in structure and colour,

according to the kind of warble-fly it represents, but for our purposes the distinction is unnecessary. The mature warble-fly is about $\frac{1}{2}$ to 1 inch long, and has eleven circular ridges running round it, each ridge showing one row of bristles. In colour it is greyish-yellow speckled brown, or uniformly brown.

Life-History.—In the hot weather of July and August the fly deposits her eggs on the hair of cattle (usually about the shanks), and the larvæ that develop are subsequently licked into the mouth and swallowed. They penetrate the walls of the œsophagus (in which they may occasionally be found), and migrate, settling finally in the subcutis of the back; here they develop, and in so doing set up a local inflammation with pus formation. On this pus the adult larvæ thrive. By sloughing of the skin at the summit of the swelling, the maggot escapes on to the ground, and in three to six weeks develops into the fly. The warbles make obvious their appearance under the skin of the back, usually in February, March, or April. Although found in the œsophageal walls, they have never been found in the muscles, and some authorities hold that the fly pierces the skin and deposits the eggs directly into the subcutis.

Appearance of the Carcase.—Each warble causes a perforation in the hide, and if they are sufficiently numerous the hide is ruined, with considerable loss to the butcher. On an average, the value of an ox-hide is about 30s. The flesh immediately beneath a warble may also be spoiled, being straw-coloured and jelly-like immediately after slaughter (called 'licked beef' or 'butcher's jelly'), and in a few hours becoming dirty green.

Judgment.—Removal of the affected areas of meat is all that is required.

2. *Larva of Œstrus Ovis.*—This larva is found in the nasal cavity and the adjoining air-sinuses of sheep. The *Œstrus ovis* (sheep botfly) deposits her ova about the nostrils, from which spot they migrate into the nasal cavity and the adjoining sinuses. They are sometimes so numerous that, by their growth and the pressure they exert, they cause

destruction of the ethmoid and turbinal bones, and may even invade the brain.

During the life of the sheep, if these bots are in large numbers, they may produce a foul discharge from the nostrils, with sneezing and shaking of the head, and may occasionally be the cause of violent excitement.

The bot in appearance is similar to that of the warble-fly, but is about half the size and of a dirty grey colour.

Judgment.—If gross changes have been brought about in the nasal cavity and adjoining parts, or if the bots are very numerous, the entire head should be seized. But the presence of one or two bots, which can be removed, does not justify seizure of the head if there are no accompanying gross changes.

3. **Maggots.**—The raw surfaces of wounds in live animals, particularly sheep, are occasionally chosen as the site on which certain flies deposit their larvæ. The fly most commonly responsible is the *Lucillus Cæsar* (a large blue-bottle), but the *Sarcophaga magnifica* and the *Musca Cæsar* (meat maggot fly) have also been responsible. Not only are wounds selected, but any constantly damp area, such as that about the tail or under the eyes, may be chosen. The development of the larvæ causes much irritation, and the consequent rubbing of the part against posts, etc., increases the size of the sore. In sheep, sores of this description occasionally extend over the whole of the croup, and have been recorded to have reached the peritoneal cavity and caused peritonitis.

These maggots are wire-like, very motile, of a greyish-white colour, and about $\frac{1}{2}$ inch long. They develop very quickly, and attain full size in two or three days. They do not multiply, so that simply removing them effects a cure.

Three flies are held responsible for the dipterous larvæ that develop on dead meat. They are—(1) The house-fly (*Musca domestica*); (2) the blow-fly (*M. vomitoria*); (3) the flesh-fly (*Sarcophaga carnaria*).

The house-fly and blow-fly deposit eggs on both fresh and

decomposing meat. In twenty-four hours the larvæ have hatched out. The flesh-fly, however, deposits living *larvæ* on decomposing meat only. The mere presence of dipterous larvæ on meat is therefore no proof that this is putrefying.

Flukes.

The two well-known parasites of this name are the *Distomum hepaticum* and *D. lanceolatum*. But while the former is very frequently encountered in a course of inspecting carcasses, the latter is comparatively rare. These parasites belong to the Trematode division of the Plathelminthes, or Flat-worms.

Distomum Hepaticum.—This trematode has its usual habitat in the liver of cattle and sheep, and its presence has been recorded in the liver of the horse. The adult fluke has the appearance of a leaf or a miniature flat fish. It varies between $\frac{1}{2}$ to $1\frac{1}{2}$ inches in length and is about three times as long as its broadest part. In colour it is a pale yellow in the centre, with a liver-brown outer zone. The anterior end is conical, but the posterior half is flattened, and the whole of the parasite is studded with fine bristles. It has a mouth or oval sucker at its conical or anterior end. It is hermaphrodite, and passes eggs of a brownish colour, which in size measure $130\ \mu \times 70\ \mu$ ($\mu = \frac{1}{25000}$ inch).

Animals affected.—Cattle and sheep are most commonly affected, but all domestic animals and human beings are susceptible. It is, however, rare in pigs.

Life-Cycle of the Distomum Hepaticum.—Like several others already described, this parasite requires two distinct hosts in order to complete its life-cycle. The adult flukes are hermaphrodite, and pass their eggs into the intestine of their host, whence they are discharged in the fæces. In a moist warm place they undergo certain developmental changes which enable them to enter the body of their second host, the *Lymnæus truncatulus* (a fresh-water snail). In the fresh-water snail further development occurs, and an embryonic fluke is liberated, which attaches itself to moist

grass until ingested by cattle or sheep. Having reached the intestine of this host, it passes up the bile-duct, thus invading the liver, and there completes its development into the adult fluke. In this way flukes may gain access to the gall-bladder, or may be found in the bile-ducts in any part of the liver. The development of an embryonic fluke into the mature adult requires about three or four weeks after ingestion. Destruction of the fresh-water snails, by salting the pastures and their contained puddles of water, therefore breaks the cycle, and this is the method adopted for dealing with outbreaks of 'liver-rot.'

Occurrence.—The majority of sheep and pasture-fed cattle have a few flukes in their livers, but it is not till large numbers are present that sufficient changes appear in the liver to draw attention to their presence (see Cirrhosis of the Liver). Isolated parasites (wandering flukes) have frequently been found in the lungs, encapsuled with fibrous or cartilaginous tissue, and lying in a dark brown fluid, the whole mass forming a tumour the size of a walnut. They have also been found in the spleen, muscles, heart, and under the pleura and peritoneum.

Changes in the Liver (see Cirrhosis of the Liver).—In advanced cases the liver is enlarged, firmer than normal, with rounded edges and a regular smooth surface. It is usually yellowish in colour, from an accompanying fatty degeneration. It cuts tough, and gritty patches can be felt as the knife passes through calcified ducts. The cut surface shows thickened fibrous duct walls, some of which are calcified, and a thick reddish-brown muco-bile exuding from the opened duct. It is sometimes difficult to find a fluke, but they are to be found in the ducts. In slighter cases there may be no outward appearance of any changes in the liver, but a section will show that connective tissue has been deposited around some of the ducts and their tributaries.

Symptoms of Distomatosis, or 'Liver-Rot,' in Sheep.—The months in which outbreaks of this disease mostly prevail are from December to March. The sheep often exhibits no

symptoms during life, although at death the liver may be found to contain large numbers of flukes. Animals that do show symptoms are usually losing flesh, have diarrhoea, and signs of jaundice (*i.e.*, yellow discoloration of the conjunctiva, the mucous membrane of the mouth, and the bald parts of the skin inside the thighs). In the later stages dropsy develops, with a pendulous belly, swollen, œdematous eyelids, and œdematous swelling between the rami of the lower jaw.

Judgment.—Flukes have been described in the liver of man, but, owing to the necessity of an intermediary host, transmission cannot be recognised as occurring direct from the food animals. If the affected organs show any signs of pathological change, or if the number of flukes present is excessive, the organs should be seized. The remainder of the carcase can be dealt with in a general way, and if in a marketable condition may be passed.

Pentastomum Tænioides.

Pentastomum Tænioides is one of the Arachnoidea, a division of the Arthropoda. The names applied to the parasite and its larva are somewhat confusing, for the adult parasite goes by the names of *Pentastomum tænioides* or *Lingatula tænioides*, whilst the immature or larval form is referred to as the *Pentastomum denticulatum* or *Lingatula denticulatum*.

The adult parasite, or *P. tænioides*, is about 1 to 2 inches long, and is found in the nasal and frontal cavities of dogs, goats, horses, and occasionally of man, while its larvæ, or *P. denticulata*, are found in the viscera of cattle, sheep, pigs, rabbits, hares, and deer. This is another parasite which, for a complete life-cycle, requires two distinct hosts. It is, however, the larval form only that will be encountered by the meat inspector. Man may eat meat containing the larvæ without danger, but not so a dog, in which the larva develops into the adult. From the dog, by face-licking, etc., man may ingest the eggs of the adult parasite, and thus himself become infected with

the larval form; hence the necessity for prohibiting the admission of dogs into slaughterhouses.

Morphology.—The adult parasite (*P.* or *L. tænioides*) does not here concern us. It is sufficient to state that it is 1 to 2 inches long, resembles a miniature Indian club, and consists of 80 to 100 segments. The immature parasite (*P.* or *L. denticulatum*), when fully developed, after being encysted for six months, is about $\frac{1}{4}$ inch long, its greatest breadth being $\frac{1}{20}$ inch. It has at its anterior broad end a mouth with four claws or hooks beneath it. It is divided into 80 to 90 segments, each with a row of backward-directed bristles, so that it can only travel forwards. The undeveloped denticulata, as set free from the eggs, in the intestine are kidney-shaped and microscopic ($130 \mu \times 60 \mu$).

Life-Cycle.—The adult female in the nasal cavity of a dog, goat, or horse, lays numerous eggs, which are discharged, and infect pastures and the food of cattle, sheep, pigs, or man. These eggs, when swallowed, give exit, in the intestine of their host, to embryos, which by means of a boring apparatus migrate into the abdominal and thoracic organs, and there become encysted. In this position they require about six months for completing their several developmental changes and arriving at the stage described above (*L. denticulatum*). The future course of the denticulatum is not, apparently, decided, for whilst some authorities (Gerlach, Von Rätz) assert that it bores its way into the lungs, and escapes into the outer world by means of the trachea, Babès holds that it migrates back into the intestines, and is voided with the fæces. In some way the *P.* or *L. denticulatum* may be ingested by horses, goats, or dogs, either by means of food contaminated with excreta containing this parasite, or by meat containing the encysted parasite. Having reached the body of its second host, it migrates to the nasal cavity, and there develops into the adult parasite (*P.* or *L. tænioides*).

The Lesions in Cattle, Sheep, and Pigs, due to P. Denticulatum or L. Denticulatum.—The fully-developed larvæ

are usually to be found under the peritoneum, in the mesenteric glands, in the liver, and exceptionally in the lungs and intestinal walls. As the larvæ develop and become encysted, the invaded organ becomes hollowed out by small cavities, several of which may ultimately coalesce and form larger lesions. In the mesenteric glands, these lesions vary in size up to that of a pea, and are usually near the surface of the gland. The young semiliquid lesions are yellowish-green in colour, but change to grey as the lesions become dry and mortar-like. Intact parasites may, with the aid of the microscope, be found in the yellow-green lesions, but in the grey are usually degenerated beyond recognition. In the latter, however, may usually be found the characteristic hooks or claws.

These lesions may be confused with tuberculous foci, but are distinguishable by being all of the same age in a lymphatic gland; whilst those of tuberculosis will be found in all stages of growth. Old pentastome lesions are grey in colour, whilst old tuberculous lesions always retain their distinctive yellow tinge. Microscopic examination will also reveal either intact pentastomes or, at the least, the characteristic claws.

Judgment.—Adult pentastomes have been so rarely found in man that direct infection by the ingestion of meat need hardly be considered; but man may become infested with the larval form through the medium of a dog, and for this reason all infected organs, etc., should be destroyed. *P. denticulata* have never been found in the muscular tissue, so that this portion of the carcase may be passed if it appears marketable.

Hair Follicle Mite of the Hog (Csokor).—The *Demodex phylloides suis* is responsible in the skin of pigs for a diseased condition which resembles, and is analogous to, acne in man. This appears as small swellings of the hair follicles, which assume a greyish or yellowish colour, and contain a soft semifluid in which may be found the mites. The mites are about 0·2 to 0·3 millimetre long. The

swellings vary in size from that of a mustard-seed to that of a pea. They are most commonly found in the soft, bald patches of skin on the snout, under the throat, breast, and abdomen, and inside the thighs.

Nemathelminthes, or Round-Worms.

There are two large groups of the Nemathelminthes which, in a work of this description, require consideration. They are the Acanthocephali and the Nematodes (Thread-worms).

1. **Acanthocephali.**—Only one representative of this group requires mention here—the *Echinorhynchus gigas*. This parasite is a long round-worm (male: 2 to 3 inches long; female: 10 to 14 inches), with a globular or conical head and a proboscis armed with six rows of barbed bristles, by means of which it bores into the intestinal mucous membrane of its host. It inhabits the small intestines of pigs, but is, however, found only in French, German, and American pigs, never having been recorded in British pigs.

Judgment.—The small bowel is often rendered useless for sausage-making owing to the small abscesses and ulcers caused by these parasites. The remainder of the carcase is usually in good marketable condition, but is occasionally water-logged or emaciated. The parasite has been known to cause a perforative peritonitis, and in such cases the carcase would require seizing (see Peritonitis).

2. **Nematodes, or Thread-Worms.**—There are numerous unimportant representatives of this group to be met during a long course of meat inspection, but special mention need here be made of only three representatives; they are—(1) *Ascaridiæ* (of the subgroup *Polymyaria*); (2) *Strongylidæ* (of the subgroup *Meromyaria*); (3) *Trichina spiralis* (of the subgroup *Holomyaria*).

Ascaridiæ.—All the domestic animals have their own representative of this subdivision of the Nematodes. In the horse one finds the *Ascaris megalocephala* (big head), a parasite which is very common. It is about 6 to 10 inches long, is about as thick as a man's little finger, and tapers

towards both ends. As its name implies, the anterior end is provided with a well-marked nodular head. The parasite is usually whitish-grey in colour, and inhabits the large intestine. No intermediary host for the completion of a life-cycle appears to be necessary. It is not transmissible to man.

In *cattle* and *sheep*, ascarides are so rarely encountered and so unimportant that they need no further notice. In the *pig*, the *Ascaris suillæ* (or *Lumbricoides*) is commonly found. It is 3 to 6 inches long, whitish-grey in colour, and has a well-marked groove running its whole length. This parasite is sometimes present in the small intestine in such large numbers as to cause intestinal obstruction, and it has also been known to block the common bile-duct, and thus to cause jaundice.

Judgment.—No ill effects have ever been recorded as a result of eating the flesh of animals infested with ascarides. The flesh, however, does occasionally have both an acid odour and an acid taste. In such cases the abnormal odour is sufficient to condemn the carcass. In all cases the bowel should be confiscated and destroyed, together with its parasitic contents.

Strongylidæ.—Innumerable representatives of this group of parasites are to be found in the various food animals. Here will be considered only those most commonly seen, a brief description of their appearance being given, and an indication as to where they are to be found. It should be borne in mind that in the lungs many of the lesions caused by these parasites may be mistaken, at first glance, for tuberculous lesions (see Pseudo-Tuberculosis).

Strongylus Capillaris.—This parasite is occasionally found in the lungs of sheep, but is most commonly seen in the lungs of goats. It is a very slender thread-worm, white in colour, and resembling a fine strand of silk. It varies in length from 1 to 2 inches, and, as is the case in most of these worms, the female is slightly longer than the male.

The mature worm lives in the smaller bronchi, where the resulting irritation causes an acute hæmorrhagic bron-

chitis. The female gives rise to numerous eggs, from which embryos hatch, and then migrate into the lung tissue, setting up patches of broncho-pneumonia. Subsequently the adult worms may themselves migrate into the lung tissue, where they become encapsuled, caseate, and calcify, forming yellow or greyish-red nodules.

Many of the embryos may be coughed up and swallowed, so that the adult worms may be found in the abomasum (fourth stomach), producing an acute catarrh of that organ.

Strongylus Contortus.—This strongyle is found in the abomasum of cattle, sheep, and goats. It is particularly common in lambs about June. It resembles a piece of dirty brown or reddish thread, and has marked transverse stripes. It measures $1\frac{1}{2}$ to 2 inches in length, the female being slightly longer than the male. It is named *Contortus* from the uterus being twisted spirally round the intestine, as may be seen with a low power of the microscope. It obtains its nourishment from the blood of its host. In small numbers this parasite is very common; but occasionally in sheep it is so numerous as to cause anæmia and diarrhœa, so rapidly fatal that acute poisoning has been suspected.

Strongylus Convolutus.—In young cattle this parasite may frequently be found, coiled up under the epithelium of the mucous membrane in the abomasum, there forming small nodular projections each with a central opening. It is a thread-like worm measuring $\frac{1}{8}$ to $\frac{1}{2}$ inch in length, and is characterized by having a bell-shaped flap of skin over the vulva. It is frequently found in young cattle that are emaciated, anæmic, and suffering from diarrhœa (McFadyean).

Strongylus Filaria.—The parasite inhabits the lungs of sheep and goats. Bundles the size of a walnut may be found in the bronchi. It is white in colour, like a piece of cotton, and measures $1\frac{1}{2}$ to $3\frac{1}{2}$ inches in length, the female being slightly the larger. The females are viviparous, and give issue to embryos measuring $540\ \mu$ by $20\ \mu$, which taper to a point at the posterior end, whilst the anterior

end is provided with a head or tubercle. These embryos, by migrating into the lung tissue, set up verminous pneumonia (*q.v.*).

Strongylus Micrurus.—Occasionally this thread-worm is found in the lungs of cattle. It is a milky white, thread-like worm with a greasy appearance. In length it measures $1\frac{1}{2}$ to $2\frac{1}{2}$ inches. The adult worm is found in the bronchi at the base of the lungs, and if near the surface small lesions result, which are firmer than the normal lung, and resemble patches of mother-of-pearl. A cross-section of such a lesion shows in it dilated small bronchioles, containing froth in which may be found the mature micrurus. This, too, is a viviparous parasite, the female giving issue to embryos. These migrate into the lung tissue about the month of July, and become mature in about six weeks (Tapken).

Strongylus Paradoxus.—This strongyle inhabits the lungs of pigs. It is a white, thread-like worm 1 to $2\frac{1}{2}$ inches long, and is frequently found in large numbers without causing any apparent disturbance in its host. Mother-of-pearl-like lesions are present, similar to those described under the *S. micrurus*, usually at the base of the lungs. The parasite is responsible also for bronchitis and bronchiectasis (dilatation of the bronchi), but never causes broncho-pneumonia.

Strongylus Rufescens is probably the commonest of all strongyles, and is found most frequently in the lungs of goats and of adult sheep, but cattle are not exempt. The worm is thread-like, reddish-brown in colour, and measures 1 to $1\frac{1}{2}$ inches in length. It is responsible for the disease known as 'husk' or 'hoose.' The female is oviparous (gives issue to eggs, from which the embryos hatch). The eggs are large ($90\ \mu$ by $40\ \mu$), elliptical, and of a brownish colour, with granular contents. The embryos ($360\ \mu$ long) are actively motile, but when not in motion are curled up at one or both ends. The embryos, by migrating into the lung tissue, set up patches of broncho-pneumonia (see Verminous Pneumonia).

Judgment in the Case of Strongyles.—Owing to the great frequency with which the inspector meets lungs invaded by these parasites, he should, by removal of the worms, as far as possible try to make the lungs fit for consumption. If, however, the invasion is very extensive, or there are found marked inflammatory changes, the organ should be seized. An endeavour should, however, be made to pass whatever can reasonably be permitted, bearing in mind that these parasites are not transmissible to man.

Trichinosis or Trichiniasis.—Trichinosis is a parasitic disease which affects man, pigs, and the carnivorous animals, and is caused by the *Trichina spiralis*. It is with the pig only, as far as this disease is concerned, that the meat inspector has to concern himself.

The *Trichina spiralis* belongs to the Holomyaria group of Nematodes, and is classed as one of the Trichotrachelidæ. The larval form of this parasite lives in the muscular tissue of its host; and is often alluded to as the ‘muscle trichina,’ in contradistinction to the adult parasite, the ‘intestinal trichina,’ that is found in the intestinal canal.

For a complete life-cycle the parasite utilizes two hosts, the two usual animal hosts being the pig and the rat. The unaffected pig becomes infected by eating trichinous rats or pork, whilst the rat becomes infected through eating trichinous pork.

Most animals can be infected experimentally, and man, unfortunately, is frequently infected by eating trichinous pork which is insufficiently cooked. Fowls, though never affected with the muscle trichina, can, after eating trichinous pork, act temporarily as the host for the intestinal trichina, the immature newly-born parasites, instead of penetrating into the muscular tissue of the fowl, being voided with its fæces. The same thing occurs in the case of oxen and sheep that are infected experimentally.

Location.—Trichinosis in man is rare in Great Britain, and is practically unknown in home-bred pigs, but cases sometimes occur in man from eating foreign pork. As the result of improvements in meat inspection, trichinosis in

man is becoming less common in parts of Germany where it was at one time rife (Ostertag). The disease in man is still very common in China. In some parts of America the parasites are present in about 2 per cent. of the pigs.

The Mature Parasite (Intestinal Trichina).—The female parasite is $\frac{1}{8}$ to $\frac{1}{8}$ inch in length, the male $\frac{1}{12}$ to $\frac{1}{16}$ inch. Each is pointed at both extremities, the anterior end more so than the posterior. It has a thin transparent cuticle, and is provided with a circular mouth, an alimentary canal, and a cloacal slit. The eggs are hatched within the female, whose posterior portion is crowded with them.

The Life-Cycle of the Trichina.—Within thirty-six to forty-eight hours of ingesting trichinous pork, the muscle trichina is liberated, its capsule being digested by the gastric juice. It matures, and copulation occurs before the end of forty-eight hours. Shortly after performing this duty the male parasite dies—hence the scarcity or absence of males in the intestinal canal of the infected man or pig. The adult female, however, lives for five to six weeks in the intestines, and during that time produces 8,000 to 10,000 living embryos (Braun). The course taken by these embryos is a disputed point. It was suggested that they penetrate the intestinal wall and the peritoneum, and burrow their way into the muscular tissue. The embryos, however, have no boring apparatus, and have never been found in the peritoneal cavity. It has also been suggested that the embryos are carried by the lymph-stream to the general circulation, and are thus transmitted to the muscular tissue (Heitzman). This theory seems more likely to be correct, for it is supported by the fact that embryos have been found in the smaller arteries. By these channels the embryos are carried to the muscles, a position inside the sarcolemma of which is essential for their life. In tissues other than muscular they die. In some way, then, the embryos reach the muscles some seven or eight days after ingestion of the trichinous pork—the majority within fourteen days. Within three weeks of ingestion the newly-born embryos are fully grown, have

penetrated the sarcolemma, and reached the centre of the sarcous substance. Here they curl up in S or figure 8 form, and develop a capsule. The parasite is now $\frac{1}{25}$ inch long, when extended, and lies in a small quantity of finely granular material (? its food), which is enclosed by a chitinous capsule (a product of the parasite's excretion). Outside this is the stretched sarcolemma, or a connective-tissue capsule formed by the intermuscular fibroblasts. By the end of three months the capsule formation is complete, and the remainder of the invaded muscle fibre has under-

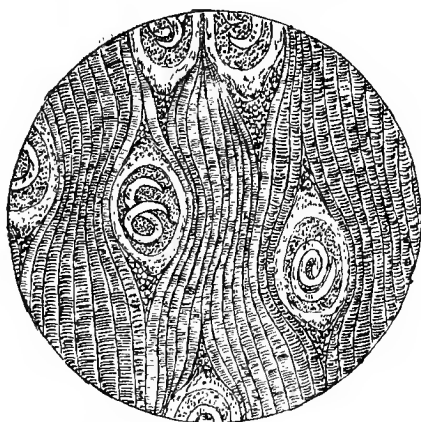


FIG. 22.—MUSCLE TRICHINÆ.

gone fatty degeneration (Fig. 22). Calcification of the capsule itself occurs in twelve months, but its contents may continue living as long as ten years.

The *muscular lesion* is about 0·5 millimetre long, and the naked eye cannot be relied upon to detect its presence. A single encapsuled worm, when calcified, may, however, be just visible as a tiny white speck. With a magnification of 40 the mature lesion is seen to be ovoid in shape, with a transparent capsule, through which is visible the curled-up worm. The capsule is surrounded by a doubly-contoured wall of fatty degenerated muscle. Calcification of the capsule starts at the two poles, and spreads towards the

equator. In order to see the trichina in a calcified capsule, it must be moistened with dilute hydrochloric acid.

Examination of Muscle for Trichinæ.—Samples of muscle for examination should be taken from each of the most commonly infected sites—viz., the pillars of the diaphragm, the muscles of the larynx or tongue, the abdominal muscles, and the intercostals. The recognized method of examination is to snip six little pieces the size of an oat-grain—but small strands may be cut longitudinally—from each of the four groups of muscles named, taking the samples from the tendonous ends of the muscles. These samples are arranged in series between two wet slides, and subjected to pressure by the fingers till thin enough to transmit light. A specially-made pair of slides, provided with a screw (compressorium), may be used with advantage. These preparations are then examined with a magnification of 40.

If examining samples from hams, etc., add to the slide preparation some water or dilute acetic acid, or caustic potash solution. To re-examine dried specimens, it is necessary to add only glycerine or salt solution.

When coloured with ordinary stains, the dead or degenerated worms are stained diffusely, whilst the living worms are not so stained.

Predilection Seats of the Muscle Trichina in the Pig.—In muscles the encapsuled worms are most abundant near the junction of the muscle and its tendon. Any part of the muscular system may be invaded, but, as already stated, the groups of muscles most constantly affected are the pillars of the diaphragm, the tongue, the muscles of the larynx, the abdominal muscles, and the intercostals. It is suggested that the embryos frequently pass through the capillaries of the ordinary muscles, but that the automatic contraction of the respiratory muscles retains many of them.

Trichinous pigs rarely show any symptoms during life, and have been 'shown' at exhibitions without any suggestive symptoms being noticed.

Vitality of the Trichina Spiralis.—*Heat*.—A temperature of 62° to 70° C. is sufficient to kill the parasite, but a large 'joint' or a piece of meat weighing over 6 pounds is not, by the ordinary process of cooking, raised above 60° C. in its centre (Woodhead). In order to render large pieces of trichinous pork harmless, they require constant cooking for twelve hours. Most of the meat is by that time colourless or light grey in colour.

Cold.—Ordinary refrigeration for seven weeks has proved insufficient to kill the parasite, but exposure to a temperature of -15° C. is sufficient for this purpose.

Pickling.—If the meat is cut up into small pieces, or the pickling aided by injection, ten to fourteen days' exposure to the brine kills the non-calcareous encysted parasite. But in large pieces of meat the parasite is unaffected after soaking for five months in the brine.

Smoking, as carried out in the ordinary process of food preservation, has no effect on the vitality of the parasite.

Decomposition.—*Trichinæ* have been found alive in meat three months after the commencement of putrefaction.

Judgment.—The entire carcase should be seized and destroyed if only one *Trichina spiralis* be found in any of the meat samples examined, even though the muscle trichinæ are calcified or thought to be dead.

Tæniæ (Tapeworms).

From a meat inspection point of view, tapeworms are of little importance. They are found in the intestinal contents, are usually few in number, and do little harm to their host; besides which, none of the tapeworms found in our food animals are, as far as we know, transmissible to man. Brief mention may be made of the few most commonly seen in a slaughterhouse, but apart from that, no attention is needed, except to state that the cystic stages of these tapeworms have not yet been discovered.

The *Tænia Expansa* is found in both cattle and sheep. In cattle this worm may reach the length of 100 feet, and be

half an inch wide at its extremity. In sheep they are occasionally so numerous as to cause diarrhoea, anæmia, loss of flesh, and death. The worm has a minute head, and, as each proglottis is the same width in front and behind, the edge of the worm is not given a serrated appearance.

The *Tænia Denticulatum* occurs in both cattle and sheep, but is not common. It may reach the length of 4 to 5 feet, has a large head and a serrated edge, owing to the individual proglottides being wider at the posterior than at the anterior extremity.

The *Tænia Alba* is occasionally found in cattle and sheep, whilst in the *Tænia Ovilla* the sheep has a tapeworm peculiar to itself.

Judgment.—Tapeworms do very occasionally result in anæmia and emaciation of their host, and this condition may be so marked as to necessitate seizure of the carcass. Provided, however, the carcass is otherwise in good condition, their presence need not be considered, but the worms themselves should be burnt.

Sarcosporidia.

Sarcosporidia are unicellular animal parasites, and form one of the suborders of the Sporozoa. Taken as a whole, they are elongated oval structures, found usually in the muscle fibres or connective tissue. All our food animals are liable to be invaded by these parasites, but most commonly so the pig.

The two most common varieties of Sarcosporidia likely to be seen in the slaughterhouse are the Sarcocysts and the Balbianiæ.

Sarcocystis Miescheriana (Rainey's Corpuscles).—This small parasite is found in the flesh of pigs. It is there occasionally visible to the naked eye ($\frac{1}{12}$ inch long). Under the microscope, on a lateral view, it appears sausage-shaped, and shows an external capsule, which has canaliculi and striæ running through it. In its interior

there are numerous small kidney-shaped bodies, which are regarded as spores. These parasites are usually found in the substance of the muscular fibres, particularly those of the hind-quarters, and are enclosed by the distended sarcolemma. These sarcocysts are probably never responsible for any disturbance in health, and, although common in pigs, do not appear to be transmitted to man by ingestion of the flesh. Similar but larger cysts (*sarcocystis tenella*), which probably belong to another species, have been found in oxen, sheep, horses, and man.

This condition is one that may be mistaken for 'measly pork.'

Rainey's corpuscles may become calcified at any stage of their development (see *Calcified Parasites*).

Judgment.—If the parasites are microscopic and do not affect the appearance of the flesh, their presence may be ignored. If, however, they are very numerous and visible to the naked eye, so as to make the flesh repulsive, the affected parts should be seized.

Balbaniæ are parasites somewhat larger than sarcocysts, and may reach the size of an oat-grain, or even of a large pea. Each parasite consists of an enveloping membrane, with the enclosed space partitioned into cavities, and each cavity contains several falciform corpuscles (crescent-shaped bodies) which, when the cyst is ruptured, escape with a milky fluid. If small and not numerous, the parasites are not likely to be noticed during the usual naked-eye inspection of meat, and the flesh usually appears quite normal. But the microscope will reveal the parasite distending the sarcolemma of the invaded muscle fibre, which itself is often undergoing hyaline degeneration. If the invasion is very extensive, the flesh may be cedematous, a condition, however, that is not common.

Animals affected.—Sheep are the usual hosts of these parasites, but oxen, pigs, and goats, are far from exempt. The most common sites in sheep are the muscular tissue of the œsophagus and the pharynx. Occasionally the muscles of the tongue, neck, trunk, and hind-quarters, are affected.

Judgment.—No experiments appear to justify a belief that these parasites are transmissible by ingestion either to man or beast (Cobbold, Leuckart). If they are microscopic, and the flesh otherwise healthy in appearance, the carcase may be passed ; but if the parasites are visible to the naked eye, the affected parts should be seized.

Calcified Parasites.

Calcified parasites, or, as they are sometimes termed, 'calcareous concretions,' are far from rare in our food animals ; but it is only in the pig that they are of common occurrence in the flesh. The parasites that most commonly undergo calcification are Rainey's corpuscles, cysticerci, echinococci, and the *Trichina spiralis*. It is of great importance from a sanitary point of view to be able to say definitely the true origin of these concretions.

Calcified Rainey's Corpuscles.—Calcification of these parasites is not associated with any particular stage of development, and is therefore found in parasites of all sizes. It usually commences in the centre of the parasite, and spreads centrifugally. Totally calcified corpuscles lie in the muscle fibres surrounded by a connective-tissue membrane, and are more or less elongated in form, with the muscle fibre at either end unaffected and showing the normal striation, thus differing from trichinous lesions. Many of these concretions are visible to the naked eye, but a few are microscopical.

Calcified Cysticerci.—Cysticerci developing in the muscular tissue may die at any stage of their development, undergo caseation, and finally become calcified ; so that the size of calcified cysticerci is very variable, and may be anything up to that of an oat-grain. The smallest calcified cysticerci are, however, larger than either calcified Rainey's corpuscles or calcified trichinæ ; they lie, too, *between* the muscle fibres, not in them, and have a fibrous capsule which may be recognized with the naked eye. In larger calcified cysts, hooks and calcareous corpuscles may be found with the aid of the microscope.

Calcified Echinococci.—These are rarely found in the flesh, for the reason that echinococci themselves are rarely found there. In cases, however, of very extensive invasion of the host, a few will be found sprinkled through the muscular tissue. These concretions lie *between* the muscle fibres, are larger than calcified Rainey's corpuscles or calcified trichinæ, and show the characteristic lamellated cuticle, the hooks, and the calcareous corpuscles. Calcified echinococci in the flesh are always accompanied by numerous lesions of a similar nature in all the visceral organs.

Calcified Trichinæ.—Calcified trichinæ are barely visible to the naked eye, being about $\frac{1}{40}$ inch long. Calcification never starts till the trichina is six or seven months old, and many pigs are slaughtered under twelve months of age. They have little or no capsule, and lie *inside* the muscle fibre, the ends of which undergo fatty degeneration and lose their normal cross-striation. As in Great Britain trichinosis is rare in pigs, this form of concretion is seldom seen there.

CHAPTER X

Infectious diseases : Tuberculosis—Pseudo-tuberculosis—Actinomycosis
Botryomycosis—Glanders—Anthrax—Black-quarter—Swine erysipelas—Swine fever—Swine plague—Parturient fever—Bacillary necrosis—Malignant œdema—Malignant catarrh—Braxy—Cow-pox—Sheep-pox—Tetanus—Cattle plague—Foot and mouth disease—Contagious pleuro-pneumonia of cattle—Texas fever—Rabies.

Tuberculosis.

TUBERCULOSIS in the lower animals is so important from a public health point of view, that the subject is here dealt with in detail.

Tuberculosis is a disease caused by a specific organism, known as the *Bacillus tuberculosis*, or Koch's bacillus.

The bacilli are essentially tissue parasites, growing usually in the interstices, lymph vessels, or spaces of the tissues. They probably never multiply in the blood itself, although they are at times transported by the blood. Even in these cases the blood is soon deprived of them by their arrest in the capillaries through which the blood passes. Tuberculosis is the most prevalent disease met with in food animals, and, next to septicæmia, is the most important from a sanitary point of view.

Characters of the Bacillus.—The tubercle bacillus is a small, slender, often slightly curved rod, 3 to 4 μ long ($\mu = \frac{1}{250000}$ inch), with rounded ends. It is common to find clumps of the bacilli arranged in faggot-like groups. It is non-motile, and never grows in filaments. In stained specimens some will be found coloured uniformly throughout, whilst others appear speckled. Staining with simple

stains requires an exposure to these of two to three days, and the bacillus does not stain by Gram's method. The method now adopted for staining tubercle bacilli is that of Ziehl-Neelsen :

1. Make a cover-glass film in the ordinary way, and pour on to it a hot solution of carbol fuchsin; leave for five minutes, and then wash in water.

2. Dip the cover-glass once or twice in 25 per cent. sulphuric acid solution, washing immediately until the faintest trace of a pink tinge remains in the film.



FIG. 23.—TUBERCLE BACILLI. FROM A PURE CULTURE.

3. Then counterstain the film for five minutes with an aqueous solution of methylene blue. By this method the bacilli are stained red, and the cells, etc., blue.

For the purpose of this work, it is unnecessary to give details of the artificial culture of tubercle bacilli. It will be sufficient to say that, while the first growth on artificial media is difficult to obtain, subcultures from this are easily made.

Animals affected.—All our 'food animals' are liable to tuberculous infection. 1. About 20 to 30 per cent. of our *cattle* are to some extent tuberculous. Young cattle up to one year old are rarely affected (about 0·05 per cent.), but the percentage increases with each year of life; and in old dairy cows, ten to fifteen years old, it may reach 75 per cent. 2. Amongst *pigs* in this country, the tuberculous average 4 or 5 per cent. Seeing that in pigs tuberculosis tends to generalize so rapidly, they are quite as serious a source of danger to man as cattle, although a smaller percentage is affected. 3. *Sheep* and *goats* are

rarely, if ever, attacked with tuberculosis (about 0·002 per cent.). 4. It is difficult to give even a rough estimate of the percentage of cases of tuberculosis in *fowls*, but the disease occasionally becomes a plague, for the stamping out of which destruction of both fowls and buildings is necessary. Other domesticated birds, turkeys, ducks, and confined pheasants, are occasionally affected. Avian tuberculosis is no doubt the same disease as mammalian tuberculosis, but elaborate methods (viz., repeated passage through animals) are necessary in order to infect fowls with human tuberculosis. According to Nocard, avian tuberculosis is not transmissible to man. 5. *Rabbits* are very susceptible to experimental infection, but are rarely attacked naturally, even when kept in confinement. 6. *Horses* in this country are not much used for human food, and in them tuberculosis occurs in only about 1 per cent.

Can Man contract Bovine Tuberculosis?—Von Behring in his Cassel Lecture (1905) stated that he believed that tuberculosis in human beings, even when it appeared first in adult life, was really due to infection during infancy through the feeding of children on tuberculous milk, the disease having been dormant during the interval.

Ravenel in 1905 pointed out that the bovine tubercle bacilli had a much greater virulence in other animals than had human tubercle bacilli; and he argued that it would be remarkable, seeing how susceptible man is to tuberculosis, if he were immune to the more powerful virus.

Koch in his Nobel Lecture (1906) stated that he believed bovine tuberculosis was not transmissible to man, but qualified his statement by saying that, at any rate, generalized tuberculosis, and, above all, pulmonary tuberculosis, in man, never resulted from the transmission of bovine tuberculosis to the human being.

The view now generally accepted is that human tuberculosis may be, and is, caused by bacilli of either bovine or human origin.

Theobald Smith in 1898 obtained two types of tubercle

bacilli from the mesenteric glands of children, one type conforming to the distinctive tests of bovine tubercle bacilli. Other authorities have also obtained the bovine type from man. The Royal Commission, in its second interim report (1907), confirmed the conclusions come to by various individual investigators, that there is a bovine and a human type of tubercle bacillus, and that these are distinct and recognizable. They also found that, in human beings, ten out of nineteen cases of primary abdominal tuberculosis, three out of eight cases of tuberculous cervical glands, and one out of four cases of tuberculous sputum, were due to bacilli of the bovine type.

Primary tuberculosis of the mesenteric and cervical glands causes less than 10 per cent. of the total mortality from tuberculosis in this country. From the foregoing, therefore, it will be seen that about half (thirteen out of twenty-seven) of these are bovine in origin. We may thus assume that 5 to 10 per cent. of the human mortality from tuberculosis in this country is due to infection from bovine sources (Newsholme, 'Prevention of Tuberculosis,' p. 184).

Method of Infection.—Cattle appear to be usually infected by the inhalation of dried expectorate containing tubercle bacilli. Infection by ingestion, however, is not uncommon even in cattle; while in pigs, horses, and fowls, it is probably the usual method of infection. In the case of pigs, milk (particularly the slime from centrifugalized milk) and its products are, perhaps, the commonest vehicles of infection. Pigs, however, are frequently fed with raw offal from slaughterhouses, and this is no doubt often tuberculous. Infection by inoculation in the lower animals is apparently rare.

Congenital Tuberculosis.—Careful post-mortem examination of thousands of new-born calves has shown that infection in this manner is rare, certainly not more frequent than 1 in 500. Calves with tuberculous mothers, however, have every facility, after birth, for contracting the disease by drinking the mothers' milk and being constantly in

contact with them. They also inhale the tubercle-laden dust, to which adult cows also are exposed.

Predisposition by Heritage.—The frequency of tuberculosis in stock with tuberculous parents is probably due rather to the extra risk they run than to any inherited predisposition. Although there is every reason to believe that different animals possess varying degrees of resistance against infection by tuberculosis, there is no evidence to show that any particular family amongst cattle possesses anything like immunity or powers of resistance that will indefinitely withstand constant exposure to infection. Some breeds of cattle are certainly more prone to infection than others. It is much commoner amongst Shorthorns, Ayrshires, and Jerseys on the mainland, than in Hereford or Scotch Highland cattle. But this, no doubt, is due to the different life such cattle lead, for Jersey cattle in the Channel Islands are practically free from tuberculosis. The more cattle are housed, the greater the risk of infection, and the less chance of withstanding, or recovering from, such infection.

Symptoms during Life.—For meat inspection to be carried out most effectively, it is necessary that those making the inspection be able to recognize the suggestive symptoms and signs to be seen during life. This recognition frequently enables the inspector to come to a better and more conclusive decision when the actual carcase is being inspected. This statement applies not so much to tuberculosis in particular as to the inspection of meat in general.

Cattle with tuberculous disease of the lungs show in the early stages no obvious symptom, except a hollow, weak, short cough. This cough can frequently be excited by pinching the larynx sharply with the fingers—a reflex that does not occur in healthy cattle. The cough is usually most marked in the early morning.

In the more advanced cases there is loss of appetite; the coat looks dull, dry, and unlicked. The muzzle is dry, and the eyes are dull. There may even be difficulty in breathing, shown by panting and dilatation of the nostrils. A discharge from the nostrils and diarrhoea are frequent,

and emaciation is marked. The temperature will be found to be raised to 104° or 105° F.

The recognition of suggestive symptoms is, however, more particularly useful in cases of tuberculous mastitis in cows. In this condition there is a diffuse, *painless*, firm swelling of one quarter, usually a posterior one, which enlarges slowly. Occasionally two quarters, or more rarely the four quarters, may be affected. The swelling is nodular, feels heavy, and may be almost stony. It rarely suppurates or discharges outwardly. The cow walks without sign of pain, and does not resent digital examination of the udder. The milk in tuberculous mastitis is at first normal in appearance; then it becomes watery, bluish, and flaky. It is now rich in tubercle bacilli. The supramammary lymph glands are enlarged, nodular, and may be stony hard.

In non-tuberculous mastitis, on the other hand, the affected quarter is hot, tender, and enlarges *suddenly*, whilst abscesses may form and burst outwardly. The cow walks with her legs apart, is very restive, and resents any local examination. From the first the milk is almost suppressed, and what there is, is thick, purulent, and often blood-stained. As a result of the non-tuberculous form, the affected quarter subsequently shrinks to less than its normal size, and gives no milk. The supramammary lymph gland is enlarged, but soft and tender.

Other localized signs may be noticed, the cause of which might be overlooked during inspection of the carcass. Such are enlarged, thickened, painless joints, or painless swellings over a bone, both of which conditions are usually accompanied by hard and enlarged adjacent lymph glands.

Intestinal tuberculosis in the pig shows itself during life by cessation of growth and loss of flesh. The mucous membranes are pale, and the skin sometimes covered with dark grey crusts (see Sooty Mange). Later in the disease there is vomiting and diarrhoea, the flanks are tucked up, the belly becomes pendulous and the eyes sunken.

Tuberculin Test.—Before leaving the subject of symptoms

during life, it will be well to say a few words about the tuberculin test in cattle, and its fallacies. The test usually carried out is the subcutaneous one. The cattle are kept indoors, protected from draughts, and provided with their usual food. Between the sixth and fifteenth hours, after the subcutaneous injection of tuberculin, large quantities of cold water should not be allowed.

The temperature of the cow about to be tested is taken in the morning, and again at the time of the injection. The normal temperature of the cow is 101.5° to 102° F.

The quantity of tuberculin used for each test is 40 to 50 minims, according to the size of the animal. The whole dose of tuberculin is injected under the loose skin behind the elbow, and the temperature taken at the ninth, twelfth, and fifteenth hours after injection. If at these readings the temperature rises to 104° F. or more, the cow is classed as tuberculous; if the temperature rises to only 103° F., the reaction is doubtful. In no case is the reaction reliable, if at the time of the injection the temperature is already 103° F. or more.

Useful as the tuberculin test no doubt is, it has its fallacies. An injection of tuberculin, as described above, prevents a temperature reaction to any subsequent test made during the next three or four weeks. This means is sometimes adopted to 'fake' animals before the actual test is carried out. Again, dosing the animal with febrifuges, such as antipyrin, just prior to the test, prevents the temperature reaction. And, lastly, animals in an advanced stage of the disease are so thoroughly auto-inoculated with tuberculin that they frequently fail, when tested, to give the temperature reaction.¹

Anatomical Changes.—The specific lesions of tuberculosis vary greatly in form and extent, and may be found some times in one organ, sometimes in another. There are however, a few organs more constantly affected than others.

The tuberculin test and the various methods adopted are dealt with at length by the author in the *Journal of the Royal Institute of Public Health*, November, 1910.

Tuberculous lesions may be 'localized,' and are then usually 'primary,' or they may be 'generalized' or 'secondary.'

A *primary* or *localized* lesion in an organ is the result of infection of that organ with tubercle bacilli from the outside world. It occurs at the site of entrance, or near by, and does not depend upon infection through the transmission of the bacilli by the blood or lymph stream—for example, the lesions in alimentary tuberculosis in pigs and young cattle, and the tuberculous broncho-pneumonia, with its attendant tuberculous bronchial glands, in older cattle. In the lower animals tuberculosis tends to be 'localized.'

Generalized, *embolic*, or *secondary* lesions are those resulting from infection by transmission in the blood or lymph stream of bacilli from some pre-existing tuberculous focus. These lesions tend to be spherical, and rarely suppurate. They are due to a tuberculous lesion breaking into a vein or into the thoracic duct, and discharging into it the tubercle bacilli. This generalization may be only slight, and may result in chronic tuberculosis not calling for immediate slaughter of the animal, if the number of tubercle bacilli be small. If large numbers of bacilli are poured into the circulation, all the organs may be seriously infected, and an acute miliary tuberculosis be produced, which will speedily cause the death of the animal if it be not slaughtered.

In generalized tuberculosis some organs are more constantly affected than others. The muscular system, for instance, is rarely, if ever, affected. This difference may be due (1) partly to the fact that, before the blood reaches certain of the organs, it has been more or less filtered of the invading bacilli by other organs; or (2) it may be due to some peculiar secretion of particular organs which make them unsuitable for the growth of the bacilli. The normal acidity of muscle is put forward as the probable reason for its tissues so rarely showing any anatomical changes, even in the most advanced cases of generalized tuberculosis.

If generalization result from the entrance of tubercle

bacilli into the thoracic duct or into a vein (other than that of the portal circulation), the lung is the first organ to receive the blood. In the lung, therefore, the majority of the organisms will be arrested. If, on the other hand, the tubercle bacilli enter a portal vein or one of its contributories, they pass with the blood into the liver before reaching the lungs, and the majority of the organisms will be arrested in the liver. Hence, as one would expect, the lungs and the liver in a generalized tuberculosis are the organs most constantly affected. In order of frequency, the organs next to suffer are the spleen, kidneys, prescapular and inguinal lymphatic glands, udder, bones, and joints. It may be observed, therefore, that in a generalized tuberculosis, no lesions, other than the primary ones, can be found, except in the lungs or in the liver.

In young cattle (up to four years) the spleen is tuberculous more frequently than the kidneys, which, indeed, escape almost altogether; whilst in adult cattle it is not the spleen, but the kidneys, that suffer most frequently.

In pigs, the lungs, liver, and kidneys, are as frequently affected as in cattle, but tuberculous lesions in the bones—particularly the vertebræ—are more frequent.

A Typical Tuberculous Lesion.—Wherever in the tissues a tubercle bacillus is arrested, it starts a specific reaction, unless such a bacillus is destroyed by the leucocytes or finds the tissue unsuitable for growth. As a result of the irritation caused by the bacillus, leucocytes migrate to the part. In about six days the specific irritation causes proliferation of some of the fixed cells of the part—viz., connective-tissue cells, endothelium of capillaries, or lymph vessels—with the result that so-called ‘epithelioid cells’ are formed. With increased multiplication of the tubercle bacilli, this epithelioid-cell formation ceases, and those already formed either fuse together or enlarge, become multinuclear, and form the so-called ‘giant-cells.’ Simultaneously, connective tissue is laid down around the tuberculous focus as an attempt to shut off further spread.

In cattle this fibrous encapsulation becomes very thick and dense (this is not so in man). The lesion thus described is, however, without a blood-supply, and therefore undergoes necrosis, caseation, and eventually calcification.

The escape of tubercle bacilli from such a lesion leads to the formation of another similar lesion at the periphery of the first; and if the process of encapsulation continues to be defective, an extensive tuberculous area results.

A 'tubercle' may be considered, therefore, to start from a tubercle bacillus, and two to three weeks are required to render it visible to the naked eye. In another week or so it is about the size of a common pin's head.

When just visible to the naked eye, the tubercle is grey in colour and translucent; when a little older, it is yellowish and opaque in the centre, owing to caseation; still later it becomes gritty from the deposit of calcareous salts.

A tubercle one month old, in which central necrosis is just starting, will be found on microscopical examination to be made up of three different types of cells:

1. *Small Round Cells*, found round the periphery of the lesion. These are usually sparing in number and are multinuclear. Their origin from migratory leucocytes is undisputed. Nearer the centre of the lesion are—

2. The so-called *Epithelioid Cells*. These are the most common type of cells, and small microscopic tubercles consist almost entirely of them. They are slightly larger than ordinary leucocytes, and have a single round nucleus and a large amount of cell protoplasm. Owing to pressure by their neighbours, they are often angular in outline. They probably result from the proliferation of the fixed cells of the part.

3. *Giant-Cells*.—Cells of this type are found nearer the centre of the tubercle than are the last-named. They are seldom numerous before the third or fourth week, and are not so abundant in the tubercles of oxen and pigs as in those of horses. They are very large and multinucleated, with the nuclei arranged just within the margin of the cell. Though twenty or more may be seen, these nuclei

seldom form a complete circle inside the cell, but are usually wanting at its outer pole, where the body of the cell seems to fuse imperceptibly with the surrounding epithelioid cells. It is probable that these giant-cells indicate the fusion of several epithelioid cells. A few weeks after the tubercle becomes visible to the naked eye, its central cells die, begin to break up, and caseate. Microscopically, all details of the original structure will then be found to have disappeared.

Methodical Examination of a Carcase.—Only by adopting a definite method of examining a carcase can one expect to minimize the chances of overlooking some tuberculous lesion in one or other of the tissues.

1. One should, as far as possible, examine those organs which appear healthy before cutting into those obviously diseased, and so avoid contaminating food that may eventually go into the market. Butchers should be forbidden to cut into tuberculous organs, and then to cut up, with the same knife, a carcase meant for the market.

2. In generalized tuberculosis, the parts most likely to be affected are the lungs and liver, then the spleen, kidneys, sexual organs, udder, sternum, and vertebral column, the prescapular, axillary, popliteal, knee-fold, and inguinal lymphatic glands. Speaking generally, this is the order.

In examining a carcase, start at the hind-quarters, and work towards the 'head and neck.'

(a) Examine the meat in the hind-quarters, and the lymph glands receiving the lymph from this meat—*i.e.*, the popliteal, knee-fold, inguinal, and supramammary.

(b) If the peritoneum is healthy, examine next the iliac and other retroperitoneal lymph glands. If not healthy, leave them till after (g).

(c) Examine the vertebral column (exposed by splitting the carcase), the ribs, and the sternum.

(d) Examine the prescapular and axillary lymphatic glands.

(e) Examine, in females, the udder (the supramammary lymph glands have already been examined).

(f) Examine the kidneys and the renal lymph glands.

(g) Examine the spleen, liver, and lungs, with their respective lymph glands.

(h) Examine the other internal organs and their lymph glands.

As the organs and lymphatic glands afford better nutrient media than muscle, recent lesions are more easily detected in the former. Examination of the lymph glands before examining possibly tuberculous joints and bones prevents needless dissection of the meat.

An examination such as that described leads to a definite opinion as to the presence or absence of tuberculosis, and, if this be present, shows whether it is local or generalized.

TUBERCULOSIS IN CATTLE.

In the event of finding indefinite lesions in certain portions of the carcase, the lymph glands for that area should be examined for positive evidence of tuberculosis. The specific lesions vary greatly in form and extent. We may find diaphanous tubercles just visible to the naked eye, or larger ones with a cloudy caseated centre, or a large mass consisting of several tubercles, partly calcified, and of any size up to that of a walnut or a fist.

The commonest seats of the tuberculous changes are the bronchial and mediastinal lymphatic glands, then the lungs and pleura. After these come the peritoneum, mesenteric lymph glands, liver, pharyngeal glands, udder, and kidneys, more or less in this order. In about half of all cases of tuberculosis, the lungs, with their lymphatic glands, and the pleura, are simultaneously affected. In about a third, the lungs, with their lymphatic glands, alone are affected, and in about a fifth the serous membranes alone.

In the adult ox the spleen itself is almost exempt from tuberculous changes, although its peritoneal covering suffers as frequently as the rest of the peritoneum.

In very advanced cases the intestines and uterus may be

involved, but tuberculosis of the ovaries and testicles is very rare.

Bones are occasionally attacked; but whilst tuberculous lesions in the muscular tissue itself are very rare, its lymph glands are not uncommonly diseased.

Lungs.—1. In primary tuberculosis of the lungs—*i.e.*, when infected by way of the bronchial tubes, either directly or from the bronchial glands—circumscribed caseous pneumonic foci of all sizes are found, usually at the apices or lower borders. These foci break down into small or large cavities containing a greasy, yellow, mortar-like material, or perhaps pus. These changes are accompanied by the development of dense connective tissue around each tuberculous focus, so that the lung tissue in patches becomes tough, sometimes almost cartilaginous, and occasionally calcified. In the lungs, where sepsis is possible, abscesses may result.

2. In embolic (secondary or generalized) tuberculosis, tubercles of any size, from a millet-seed to a pin's head, are found scattered uniformly throughout the lung tissue (so-called miliary tubercles). These tubercles are pale yellow, firm, and slightly translucent. Large numbers can usually be seen on the surface of the lung, and always on the cut surface. They are at first surrounded by healthy lung tissue, but later they caseate and calcify, and become surrounded by inflammatory connective tissue. By the fusion of several such tubercles, masses the size of a cherry may result. In generalized tuberculosis they are seldom larger, as the animal usually dies or is killed before extensive lesions can form.

3. Tuberculosis of the larynx, trachea, and bronchi, produces swelling and inflammation of the mucous membrane, and either rows of miliary tubercles or ulcers with thickened upraised edges are found. If this condition of the bronchi is of long standing, the bronchi may be dilated in the diseased parts (bronchiectasis).

4. In all cases of tuberculosis of the lungs (or, indeed, of any organ), the lymphatic glands receiving the lymph

from the affected part become enlarged, œdematous, and infiltrated with small tubercles, which later caseate and become calcareous. The lymph glands to be examined are the bronchial, mediastinal, sternal, and dorsal (intercostal). The anterior and posterior set of mediastinal glands may together form a mass $1\frac{1}{2}$ feet long, and, it has been recorded, enclose and compress the œsophagus.

In a considerable number of cases, while no tuberculous lesion may be found by naked-eye inspection of the lungs, yet the bronchial and mediastinal lymph glands will show distinct tuberculous changes.

Pleura.—The pleura may be infected through the lymphatic glands of the chest, or directly by extension from the lungs. A frequent form of tuberculosis in cattle (rare in pigs) is the so-called ‘grape disease.’ This commences with the formation of very minute, light grey, translucent nodules—at first smaller than a millet-seed—giving a granulated appearance to the surface of the serous membrane, a condition sometimes described as being like velvet-pile. Inflammatory connective tissue grows abundantly round these, and several such lesions combine, forming soft, gelatinous nodules about the size of a pea. These are outwardly yellow in colour, but on section show a dark red centre. As these nodules get older, they become gritty to the knife on cutting, and develop an irregular nodular surface. The more advanced nodules are ash-grey or bluish-white in colour, and are undergoing caseation and calcification.

When large numbers of such growths combine, large wart-like growths the size of a hen’s egg are formed, some pedunculated, others with a broad base. Such lesions may cover the whole of the pleural membrane (Fig. 24).

‘Grape disease’ is occasionally primary, and unassociated with any other tuberculous lesions, except those in its lymphatic glands.

Tuberculosis of the pleura, instead of taking the ‘grape’ form, may result in fibrous union (adhesive pleurisy) between the lungs and the chest wall, so that the lung

cannot be removed without the pleura being stripped off with it.

Peritoneum.—A similar condition may occur in the peritoneal cavity, the intestines and organs being covered with grape- or wart-like growths.

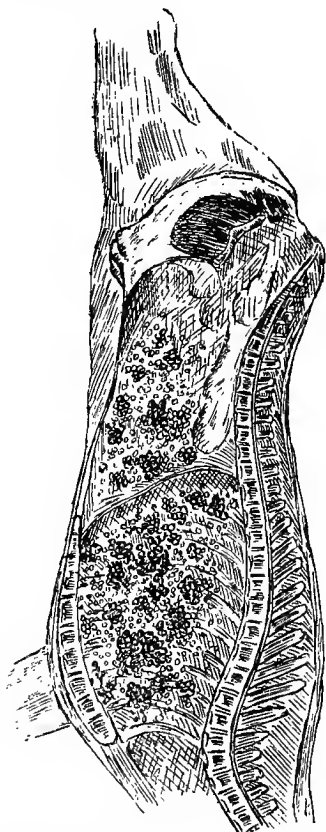


FIG. 24.—A 'HALF OF BEEF,' SHOWING TUBERCULOSIS OF PERITONEUM AND PLEURA.

It is not uncommon to find both the pleura and peritoneum affected at the same time, owing to a communication through the diaphragm by means of the lymphatics. Either may be secondary to the other, without any sign of tuberculosis being found in the lungs.

PLATE III.

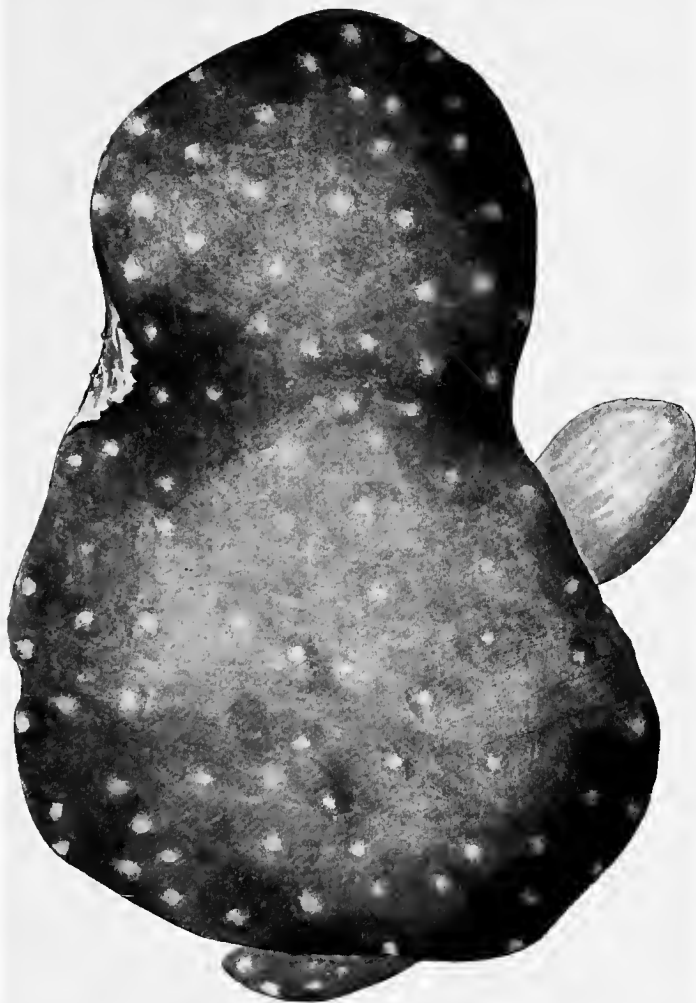


FIG. 25.—LIVER OF AN OX WITH ADVANCED TUBERCULOSIS.

PLATE IV.



FIG. 26.—SPLEEN OF AN OX, SHOWING TUBERCULOUS LESIONS.

To face page 182.

Multiple calcification may be mistaken for 'grape disease' of the peritoneum or the pleura. In it are found, studded all over the serous membrane, many or few flat elevations, of the size of a pin's head, white and chalky. They differ from the 'grapes' of tuberculosis in being flat, not caseating, and never being accompanied by any changes in the associated lymph glands (Ostertag).

Mesenteric Glands.—When tuberculous, these glands may enlarge up to the size of a walnut or an orange. They show the usual changes characteristic of tuberculosis. The more recently affected are infiltrated with tubercles; the older are a mass of caseous or calcareous material. One of these glands breaking through into one of the veins of the portal system results in a miliary tuberculosis of the liver.

Liver.—This organ may show numerous small tubercles studded over the surface, and scattered throughout its substance (Fig. 25); or the tubercles may be few in number and as large as a walnut or hen's egg. The tubercles show the usual changes—viz., central softening, caseation, and calcification, with the formation of an enclosing capsule of connective tissue. Particular attention should be paid to the lymphatic glands in the portal fissure, as they often show characteristic changes before the lesions in the liver itself are sufficiently developed to attract attention.

Spleen.—In adult cattle the spleen is usually free from tuberculous lesions, except as to its peritoneal covering. If affected, small tubercles may be seen on the surface or felt in the substance of the organ (Fig. 26). To expose the latter to view, make several longitudinal incisions into the substance of the organ. The lymphatic glands of the spleen are normally very small, and are usually left adherent to the stomach wall when the spleen is removed. They should be examined.

Kidneys.—These may be enlarged and show numerous yellow-white tubercles about the size of a millet-seed or a pea. They are encapsuled in inflammatory connective tissue, and show central softening, caseation, or calcification, according to their age and development. The lymphatic

glands—to be found along the course of the renal artery—should be examined.

Uterus.—The most frequent form of tuberculosis of the uterus is one due to the disease spreading from the peritoneum. The wall of the uterus is thickened, indurated, and contains numerous caseating or calcified foci. These yellow-white tubercles are of various sizes, and may

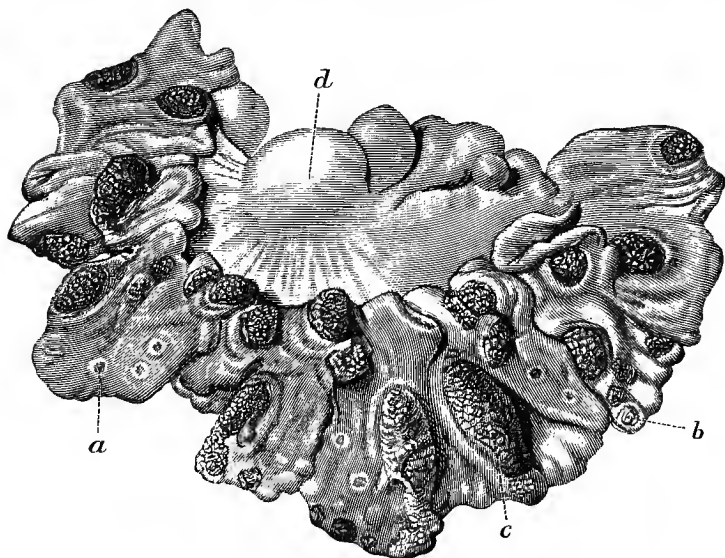


FIG. 27.—INTESTINAL TUBERCULOSIS OF CATTLE (OSTERTAG).
a and *b*, Lenticular ulcers; *c*, tuberculous infiltration; *d*, part of a tuberculous mesenteric gland.

be immediately under the peritoneum or deep in the muscular tissue of the uterus. Occasionally similar lesions are found under the mucous membrane lining the uterine cavity; and these, as a result of breaking down, leave ulcers with thickened upraised edges, and cause leucorrhœa.

Intestines.—Tuberculosis of the intestines of recent date is shown in patches of mucous membrane studded with small translucent grey tubercles; but in tuberculosis of longer standing these are often broken down, leaving lenticular ulcers with thickened upraised edges (Fig. 27).

The mesenteric lymphatic glands will show the usual changes associated with tuberculosis—viz., central softening, caseation, or calcification.

Udder.—Tuberculosis of the udder is a chronic, slowly-progressing condition, and causes a firm, diffuse enlargement of the part affected. This is usually a posterior quarter, but occasionally, in very old-standing cases, the four quarters will be found affected. In this country about 1 to 3 per cent. of our milch cows have tuberculous udders.

On section, the gland lobules are found to be swollen and uniformly grey-coloured, studded with small yellow nodules or striations, and often associated with small hæmorrhages. As the disease progresses, the tubercles enlarge and become caseous or calcareous. At the same time a dense fibrous tissue is laid down, so that the udder becomes irregularly nodular and stony hard.

The larger milk-ducts will often be found to contain yellow caseous masses teeming with tubercle bacilli, and miliary tubercles will be seen studded all over the wall of the milk-reservoirs. The supramammary lymph glands will be found enlarged, hardened, and caseous or calcareous.

Tuberculous mastitis is not the commonest form of mastitis in the cow. In the non-tuberculous there are no caseating foci, but there may be abscesses, and these occasionally burst outwardly, leaving a discharging sinus. The supramammary lymph glands will not be found caseating or calcified, but simply enlarged. In the older-standing mastitis of this type the affected quarter or quarters are 'blind' (*i.e.*, supply no milk), shrunken, and indurated, most of the mammary tissue being replaced by fibrous tissue (see Mastitis).

Muscular Tissue.¹—As the result of numerous experiments, it is generally believed that, except in the case of local extension, the flesh is only dangerous whilst tubercle bacilli are circulating in the blood. If there is a miliary tuberculosis of the organs, this certainly has occurred, and

¹ See 'Meat as a Source of Infection in Tuberculosis,' by the author, *Practitioner*, June, 1909.

investigations teach us to suspect its occurrence (1) in the acute stages of tuberculosis; (2) when foci have softened and become purulent, or when there are actual cavities containing pus; (3) when a tuberculous lesion has encroached upon and caused ulceration of the intima of a bloodvessel or of the thoracic duct. In all these cases it is probable that tubercle bacilli have occasionally gained access to the general circulation, and the flesh is then, or has at some time been, dangerous.

Demonstrable naked-eye and even microscopic lesions are exceedingly rare in the muscular tissue, except by local extension from a tuberculous bone, joint, or gland. Animals have been fed on flesh from tuberculous carcasses by many experimenters, but when nothing except flesh has been given positive results have been few, even when the carcasses of animals that had suffered from generalized tuberculosis supplied the meat substance.

Although there are a few contradictory inoculation experiments, the majority have shown that in cattle, even in advanced cases of tuberculosis and in generalized tuberculosis, the muscular tissue itself is very rarely infective, even with such a delicate test as the inoculation of raw muscle juice into the peritoneal cavity of guinea-pigs. Many of the positive results have been accounted for by contamination of the muscular tissue during its removal from a tuberculous carcase. This almost constant absence of tubercle bacilli in the muscular tissue has been accounted for by the acidity of muscle being unfavourable for their growth. It is possible, however, that when tubercle bacilli are circulating in the blood the capillaries of various organs have a greater selective power for them, and as a result few are arrested in the capillaries of the muscles (McFadyean).

McFadyean and Nocard have both shown that within a few hours of injecting large numbers into the circulation the muscles fail to contain any tubercle bacilli, while the blood itself is free in three to six days.

Even in pigs, in which generalization is so frequent, experiments fail to demonstrate tubercle bacilli in the

muscle. Positive results have, however, been more frequent when using the muscle of tuberculous pigs, sheep, and fowls, instead of that from cattle.

From the foregoing we learn, therefore, that the flesh of tuberculous animals is not necessarily infectious. In many cases, if not in the majority, when the flesh is infectious this is the result of contamination by means of the butcher's cloth, knife, etc. This occurs during the dressing of the carcase, the bacilli being conveyed either from one to another part of the carcase or from one previously dressed.

The occasions on which tubercle bacilli are liable to gain entrance to the general circulation have already been indicated. In such cases one should look for tuberculous foci of varying ages in the liver, spleen, and kidneys. The intermuscular lymphatic glands would at the same time be affected, and would show more advanced lesions than those found in the organs. In suspected cases, therefore, these glands should be microscopically examined, and the carcase judged accordingly. To remove *all* the intermuscular glands before the flesh is allowed into the market would be impossible. Although, therefore, the flesh itself is not infective, its glands make it dangerous as food.

Joints.—In tuberculous arthritis the synovial membrane becomes thickened, pulpy, cedematous, and studded with small gelatinous tubercles about the size of a pin's head. These unite, caseate, and burst, leaving ulcers with upraised edges. The joint becomes filled with a yellowish, thick fluid. Later, erosions will be seen on the cartilage of the joint, and the synovial membrane becomes covered with red granulation tissue.

Bones.—The vertebræ, ribs, sternum, and hollow bones, are occasionally tuberculous. In such cases the marrow is reddish-grey and granulating. Parts of the bone tissue are softened and breaking down (caries), around a centre that is undergoing caseation or cavity formation. The formation of sequestra is not common (Fig. 28).

Any thickening seen on the ribs should be carefully examined for such changes.

Brain and Spinal Cord.—These are occasionally tuberculous, and then show grey-yellow tubercles on their membranes, of any size from that of a millet-seed to that of a hen's egg. They are usually found at the base of the brain, and are large only when numerically small.

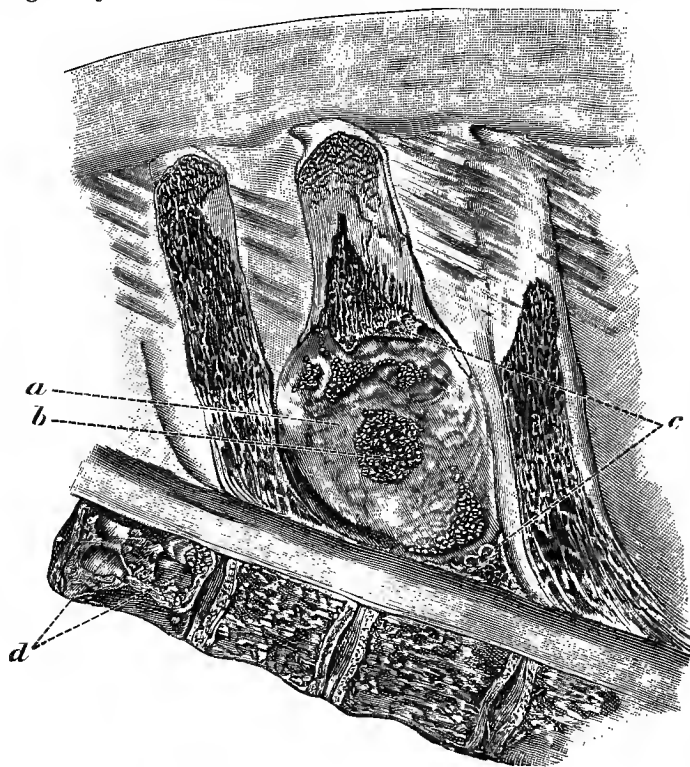


FIG. 28.—TUBERCULOSIS OF THE DORSAL VERTEBRA IN A HOG (OSTERTAG).

a, Caseous focus; *b*, deposition of lime in the caseous focus; *c*, bony bands and islands on the border of the caseous focus; *d*, section of a vertebra after removal of the tuberculous products.

The retropharyngeal lymphatic glands and those on the parotid region should be examined for the usual tuberculous changes.

Skin.—Among the lower animals tuberculosis of the skin is not common, but it occasionally occurs in the form of

fibrous tumours, abscesses, or ulcers. The lymphatic glands receiving the lymph from the affected area should be examined.

TUBERCULOSIS IN PIGS.

Tuberculosis usually occurs in pigs less than one year old, and particularly in 'show' pigs, probably owing to the amount of cow's milk such pigs receive. Only with difficulty can the tubercle bacilli be shown to exist in the lesions, unless inoculation of experimental animals is adopted.

The method of infection being almost always by ingestion, the lesions are, as one would expect, almost constantly in some part of the alimentary tract. Not, as a rule, till 'generalization' occurs are the lungs seen to be affected. There is a great tendency to rapid 'generalization' of the disease in pigs.

Pharynx.—Here a very frequent form is tuberculous tonsillitis. The tonsils are swollen, inflamed, and pitted with yellowish-white tubercles, which break down and ulcerate. Associated with this are the characteristic changes in the retropharyngeal and submaxillary lymph glands. It is not uncommon, however, to find these glands characteristically altered without any apparent changes in the tonsils.

Intestines.—It is usually the small intestine, particularly at the cæcal end, that shows tuberculous lesions. These are either in the form of yellow-white tubercles, or ulcers with thickened upraised edges. The mesenteric glands in such cases present the usual changes.

Lungs.—Tuberculosis of the lungs is rarely primary in pigs, and when present differs in no way from that in cattle.

Tuberculous lesions may be found in any of the internal organs, usually as a result of generalization, and then present the characteristics already described under Tuberculosis in Cattle.

TUBERCULOSIS IN POULTRY.

This is usually the result of eating the tuberculous excreta of affected fowls. Hence the disease is usually in the alimentary tract. It is commonly associated with dark, damp, insanitary fowl-houses. To eradicate it, the entire destruction of both fowls and buildings is often necessary.

Tuberculous lesions are usually present in the liver, spleen, or intestines, and in their respective lymph glands.

Liver.—The liver is studded with yellowish-grey tubercles of any size up to a cherry. These are well encapsuled with connective tissue, and show the usual degeneration changes, becoming caseous and mortar-like.

Spleen.—When affected, this organ usually shows large tubercles which are hard, fibrous, and mortar-like, and are usually few in number.

Intestine.—The mucous membrane is found studded with yellow-white tubercles of any size up to that of a pea, or these may have broken down and have left the usual ulcer, with thickened ragged edges.

The Joints of the Wings and Legs.—These are occasionally found to be attacked, and large swellings containing caseous, mortar-like material, are then present.

Occasionally one meets with tuberculous ulcers of the bones and skin.

JUDGMENT.

The lack of uniformity throughout the country in dealing with tuberculous carcasses is, to say the least, lamentable. In one district the whole carcass is condemned on the slightest evidence of tuberculosis, whilst in the neighbouring district in a similar case only the affected organs and its glands are confiscated. This lack of uniformity and the imperfect inspection of private slaughterhouses lead to much tuberculous food reaching the consumers. So-called 'piners,' thin and scraggy tuberculous beasts, are used for making sausages, and are bought cheap for that purpose by

butchers of a certain class, who are willing to run the risk of the carcase being confiscated at the time of slaughter.

Seeing that tuberculosis in cattle is so rife, confiscation of the whole carcase for *any* signs of the disease cannot be recommended. Such a procedure would ruin the producers and cost the country enormous sums of money.

It would be better to adopt the recommendations of the Royal Commission, for, although far from perfect, they are concise and sufficiently expansile to protect both producer and consumer.

The recommendations referred to are as follows :

In the Case of Tuberculous Carcases of Cattle.—

1. When there is miliary tuberculosis of both lungs,
2. When tuberculous lesions are present on both the pleura and peritoneum,
3. When tuberculous lesions are present in the muscular system or in the lymphatic glands embedded in or between the muscles,
4. When tuberculous lesions exist in any part of an emaciated carcase,

The entire carcase and all the organs may be seized.

1. When the lesions are confined to the lungs and the thoracic lymphatic glands,
2. When the lesions are confined to the liver,
3. When the lesions are confined to the pharyngeal lymphatic glands,
4. When the lesions are confined to any combination of the foregoing but are collectively small in extent,

The carcase if otherwise healthy shall not be condemned ; but every part of it containing tuberculous lesions shall be seized.

In the Case of Tuberculous Carcasses in Pigs, the Commissioners recommended complete seizure in all circumstances, on account of the great tendency to generalization. This is unnecessarily severe; all that is needed is to judge pigs on the same lines as cattle.

Freibank.—In Germany there is an establishment known as the Freibank, where all tuberculous carcasses are trimmed of all evidence of tuberculous disease, cut up and cooked in efficient sterilizers, stamped, and sold as inferior meat. Sentiment prevents the institution of such an establishment in this country, and thereby deprives the poorer classes of harmless and nutritious food at a reduced price.

The Effects of Cooking on Tubercle Bacilli.—Large numbers of experiments have been carried out to show the power of resistance of tubercle bacilli against heat, and the results show that it is moderate. Ten minutes at 75° C. is said by Jersin to be sufficient to destroy the vitality of tubercle bacilli; whilst experiments by Forster show that fifteen minutes at 65° C., ten minutes at 70° C., and one minute at 95° C., are sufficient. Schmidt-Mulheim found that without exception tubercle bacilli lost their virulence at the coagulation temperature of albumin.

More to the point are the experiments of Woodhead for the Royal Commission on Tuberculosis, given in Report 1, 1895. Working on the hypothesis that the flesh of tuberculous animals was rarely, if ever, infective, unless soiled during dressing of the carcase, he artificially infected the flesh before experimenting. In some cases he injected tuberculous material into the interior of the meat substance, and in others he smeared slices of meat and formed them into 'rolls.' The latter experiment is of importance, as it is an imitation of the custom among butchers to make such 'rolls,' frequently using for this purpose minced lungs, omentum, lymphatic glands, etc.—structures which are often highly virulent. Having subjected his samples to the ordinary processes of cooking, and noted the temperature at various depths below the surface, Woodhead took

the central portion of them for feeding and inoculating animals. The conclusions he came to were—

1. The centre of a 'joint' weighing 6 pounds or over never reached a higher temperature than 60° C. (140° F.) during ordinary cooking.

2. 'Rolls' of meat of more than 3 or 4 pounds weight were not rendered sterile throughout, and therefore cooking could not be relied upon to render innocuous, 'rolls' with even smeared tuberculous centres.

3. Ordinary cooking was sufficient to destroy any smeared tuberculous material on the outside of a 'joint' or 'roll.'

4. The most reliable method of cooking is boiling; next, roasting in an oven; and the least reliable method is roasting in front of a fire.

The Effects of Preservatives on Tubercle Bacilli.—(1) Forster sprinkled pure cultures of tubercle bacilli with sterilized common salt, and found them virulent two months later. (2) He found also that finely minced tuberculous organs after lying in salt brine for eighteen days retained their virulence; and (3) that salting and subsequent smoking did not render tuberculous organs innocuous, unless these are smoked for three to five hours on three different occasions, or, after smoking, are kept in a dry room for one or two months.

The Effects of Digestion on Tubercle Bacilli.—The gastric juice, being acid, has no doubt a retarding influence on the growth of tubercle bacilli, but during digestion they are not in contact sufficiently long to be destroyed. Falk and Wesener exposed tuberculous material to artificial gastric juice for some hours, but it was still virulent when tested by inoculation of animals. Strauss and Wartz showed that six hours in the gastric juice of a dog did not destroy the vitality of tubercle bacilli, but that twenty-four hours were needed (during the process of digestion three or four hours is probably the longest time any portion of a meal will remain in the human stomach, and much of the food will pass out in a shorter time). Newsholme suggests that the fatty envelope of tubercle bacilli would probably be

dissolved in the stomach more easily than under artificial conditions, as the fat-splitting enzyme of the gastric juice is very sensitive to its environment. Stern has proved that the intestinal juice may have no effect on tubercle bacilli.

Pseudo-Tuberculosis.

Under this term are classed pathological lesions which resemble those of tuberculosis, but are not caused by the tubercle bacillus of Koch. They can be divided into two large classes, according to the causal agent—viz., bacterial pseudo-tuberculosis and parasitic pseudo-tuberculosis.

Bacterial Pseudo-Tuberculosis is a large group, and includes more than one bacterial disease, as there are many bacteria that cause lesions somewhat similar in appearance to those of tuberculosis. The majority of these diseases occur only in birds, though some have been recorded in sheep (Kitt, Preisz), cattle, and horses. This condition is, however, rarely met with in slaughterhouses in this country.

The organism most commonly found (Kitt, Preisz) is present in the caseating material of the tubercles. It occurs as fine rods, $1.5\ \mu$ long and usually in thick masses. It stains with simple dyes and by Gram's method. It is non-motile.

The lesions it sets up are small whitish nodules, varying in size up to that of a large pea, and consisting of firm caseous material. These nodules are usually present in the lymphatic glands and the liver, but may be found in the lungs and muscular tissue. According to Preisz, the tubercles form rapidly and caseate at once, thus differing from true tuberculosis, where caseation does not occur for some weeks. It is only in the young newly-formed tubercles that the bacillus of pseudo-tuberculosis can be demonstrated. These nodules differ histologically from those of true tuberculosis by containing neither epithelioid cells nor giant-cells (Ostertag); nor do they calcify, but simply dry up, forming onion-like layers.

Judgment.—It should be remembered that man is susceptible to some, if not all of these conditions; and if the

nodules are scattered generally throughout the carcase, or are found to occur in the muscular tissue, the entire carcase should be seized. If quite localized to one organ, seizure of it will probably suffice.

Parasitic Pseudo-Tuberculosis (see Strongylidæ) is really an inflammatory affection of the lungs, resulting from the presence of strongyles in that organ. It is met with in cattle, pigs, sheep, and goats.

Cattle.—The parasite usually found in the lungs of oxen is the *Strongylus micrurus*. It is white, resembling a greasy piece of cotton, and about $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long. If present, it is usually to be found in the smaller bronchioles at the base of the lung. The affected area of lung, if near the surface, is firm, raised above the level of the surrounding lung, and resembles somewhat a piece of mother-of-pearl. A section of the affected lobule will show a dilated bronchiole, containing frothy mucus, and usually only a few parasites. The *Strongylus micrurus* is a viviparous parasite, but the embryos are rarely, if ever, found in the lung tissue. Occasionally these parasites are so numerous as to block the bronchioles and cause large areas of consolidated lung (see *Strongylus Micrurus*).

Figs.—A similar but rarer condition is occasionally seen in the lungs of pigs infected with the *Strongylus paradoxus*, which is a white, thread-like worm 1 inch to $2\frac{1}{2}$ inches long. It is frequently found in large numbers without any disturbance to its host. It causes, usually at the base of the lungs, mother-of-pearl-like lesions, similar to those described in cattle, that are due to the presence of the *Strongylus micrurus*.

Sheep are most commonly affected by the *Strongylus rufescens*. This worm is thread-like, reddish-brown in colour, and about 1 to $1\frac{1}{2}$ inches long. The females are oviparous, and both the eggs and the embryos may be found in the lung tissue. The eggs are large ($90\ \mu \times 40\ \mu$), elliptical, and of a brownish colour, with granular contents. The embryos ($360\ \mu$ long) are actively motile, but when not in motion are curled up at one or both ends. The

embryos by migrating into the lungs set up patches of broncho-pneumonia. The adult worms are seldom numerous, but the lungs of 90 per cent. of the yearling sheep contain a few. Old sheep are only occasionally affected.

Lesions in the Yearling.—The lung surface is blotchy, with patches of brown and pink. It is somewhat firmer than normal, and shows irregularly distributed yellowish-white nodules on the surface or in the substance of the lung. These are firm, and vary in size from a pin's head to a cherry, the large ones being on the surface of the lung, and on section appearing to consist of several coalesced small nodules. Some may be calcified or caseous. A scraping of the larger nodules under a low power of the microscope will show innumerable eggs and embryos.

Lesions in the Adult.—The nodules are occasionally absent, the lung being blotchy and firmer than normal, with a pink-red, slimy cut surface. In some of the older sheep, a condition resembling miliary tuberculosis is found, both lungs containing throughout their substance regularly distributed small nodules, as if the lung had become infected by means of the blood-stream (Walley).

In very chronic cases the lung becomes fibrous and of a dirty white colour, with a thickened adherent pleura (McFadyean).

Microscopical Appearance.—The smallest nodules consist entirely of leucocytes, and the parasites are rarely found. The large lesions, however, show sections of the parasite coiled up and surrounded with leucocytes, whilst the surrounding lung tissue is infiltrated with leucocytes and contains many eggs and embryos.

Judgment.—If the lungs are badly affected they should be seized, but the presence of a few such nodules should not condemn the whole organ. The rest of the carcass should be judged on its merits, often being in prime condition, but occasionally fevered, emaciated, and watery.

Actinomycosis.

Actinomycosis is a chronic disease caused by the actinomyces, or ray fungus. This organism belongs to the Streptothrix group, and probably lives on various vegetable structures, as straw, grain, etc. Occasionally in the lesions pieces of grain and straw have been found. It is presumed that either the grain scratches the mucous membrane, and so inoculates it, or that there was a previous abrasion which permitted the organism to enter.

The **Method of Infection** is usually by the ingestion of infected cereals, though cases have been recorded due to inoculation through a wound in the skin. Every case indicates infection by means of the infected cereals, and the disease is not transmissible from animal to animal by contact.

The Ray Fungus.—In the animal body it lives in the tissues, and has never been found in the blood, though one or two cases in which the blood has transmitted it (generalized actinomycosis) have been recorded. The appearance of the organism differs somewhat according to its age. In the lesions, the organism is found in colonies visible to the naked eye, and may be seen best by spreading a little of the pus, or of a scraping of the solid lesion, on a glass slide and holding this up to the light. The colonies are then seen as small opaque granules about the size of a pin's head. Unless undergoing calcification, the colonies show by transmitted light a greenish sheen.

Microscopically these colonies have the appearance of the flower of a daisy. When crushed, they are found to consist mainly of club-shaped elements, with their thick ends pointing outwards. Old lesions consist of nothing but these club-shaped elements, but young lesions are composed mainly of slender radiating filaments, sometimes branched and wavy, which have a thin membrane enclosing a protoplasmic content. The club-shaped elements seen in the older lesions result from a swelling of this membrane at the outer extremity, whilst the central end degenerates and disappears. Occasionally the central filament may be

traced throughout the whole length of the 'club.' Some of the smaller colonies have been shown to contain cocci-like bodies, which are sometimes classed as spores, sometimes as conidia.

The ray fungus grows on all the ordinary media, and is then almost entirely in filaments. It stains by Gram's method, with methylene blue, and by several special methods that it is not necessary to describe here. A bovine actinomycosis colony, stained by Gram's method, shows the centre stained purple, whilst the 'clubs' are unstained. But in human colonies the 'clubs' are stained purple, and the centre is unstained.

The Animals affected.—The only food animal commonly attacked is the ox, but sheep, pigs, and horses, are all said to have been found affected. Man is also a common subject for the disease.

The Lesions.—The ray fungus itself does not cause suppuration, but as the result of septic infection actinomycotic lesions often suppurate.

CATTLE.

In cattle the positions in which the lesions are most commonly found are the tongue and upper and lower jaws. Next to these come the lymph glands of the throat, and very occasionally the lips, palate, nasal mucous membrane, liver, udder, lungs, and skin.

Actinomycosis of the Tongue.—The commonest site is the side of the tongue, at the junction of the tip and the body. Here the form most frequently met with is the enlarged, indurated, and sometimes distorted tongue ('wooden tongue'). Rarely is the whole tongue affected, as partial affection makes feeding difficult, and the beast is slaughtered before the disease has time to spread so widely. On section through the tongue, one finds nodules of greyish new tissue containing the ray fungus colonies, surrounded by a dense connective tissue.

Microscopically the colonies are seen to be surrounded by epithelioid cells; outside these, by a layer of giant-cells, and,

still farther out, by spindle-shaped fibroblasts, that merge into the newly-formed connective tissue.

This condition of the tongue is occasionally found alone, but is more often associated with erosions of the mucous membrane of the tongue. These erosions are not sharply defined, and have a leathery base studded with yellow spots, which on section are found to contain ray fungus colonies, and sometimes an oat-grain (Fig. 29).

Occasionally the actinomycotic lesion takes the form of nodular, mushroom-like prominences on the surface of the

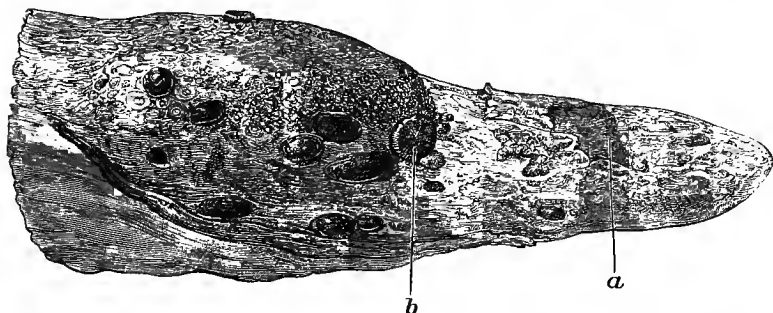


FIG. 29.—BEEF TONGUE WITH (a) ACTINOMYCOTIC EROSIONS; (b) MUSHROOM-SHAPED ACTINOMYCOMATA (OSTERTAG).

The tip of the tongue also exhibits the condition of wooden tongue.

tongue. This is also the usual type of lesion found in the pharynx, œsophagus, and stomach.

More rarely the lesions are scattered, as small nodules, throughout the tongue tissue, and whilst the tongue is still warm they can be palpated.

The submaxillary lymph glands are occasionally found affected. Suppuration is rare in the tongue, but is common in the lymph glands, when these are affected.

Actinomycosis of the Jaw (Lumpy Jaw).—The lower jaw is more frequently affected than is the upper. There is much swelling of the bone from enormous granulation formation (Fig. 30). The teeth in a late stage are either loose or have fallen out. A mass of granulation tissue surrounds septic actinomycotic foci. These discharge a thick yellow

pus that contains many of the ray fungus colonies. On section one finds the softened, suppurating foci, surrounded by a mass of spongy bone and granulation tissue, around which new hard inflammatory bone is being deposited. The soft structures, such as the gums and cheeks, become involved, and the suppurating foci may discharge their pus by sinuses through the skin.

The **Pharynx, Larynx, Œsophagus, and Stomach**, if affected, show pedunculated growths with a pale red surface, dotted with the characteristic soft yellow spots. These growths may be any size up to that of a walnut or a potato.

The **Liver**, when infected by extension from the stomach, may show solitary actinomycotic tumours, which are then similar to those already described. When infection has come by the portal vein, there may be numerous abscess-like tumours, containing the thick yellow pus and colonies.

The **Lungs** show soft, semi-gelatinous growths, varying in size from that of a cherry to that of a cocoanut. The centre of the tumour is softened, and contains the characteristic colonies.

The **Udder** may show either a diffuse induration, as in the tongue, or isolated tumours. In both cases there are nodular foci of yellowish pus, containing the granular colonies.

The **Skin** is not often affected, but may develop tumours, usually not sharply defined, and occasionally very hard and fibrous, with superficial erosions exposing the leathery surface studded with yellow spots.

FIGS.

In pigs actinomycosis is not common. The recorded cases were in the mammary gland, and were believed to be due to inoculation from the straw on which the pigs lay. One form was that of 'cold abscesses' containing large numbers of the rosette-like colonies. The other form was either 'tubercular,' with large tumours which suppurated and were discharging pus, or had a fungoid growth of actinomyces protruding from the sinus orifice.

PLATE V



FIG 30.—ACTINOMYCOSIS OF THE JAW.

To face page 200

Differential Diagnosis.—Tuberculosis and many tumours give a somewhat similar appearance ; but the characteristic colonies, as seen under the microscope, and the absence of changes in the lymphatic glands, should make the distinction certain.

Judgment.—The transmission of actinomycosis to man by means of meat has never been recorded. The affected parts of the carcase must, however, be condemned, but the remainder of the carcase, if in good condition, is quite fit for human food. In the rare exception of a generalized actinomycosis, the whole carcase must be seized.

Botryomycosis.

Botryomycosis, or, as it is sometimes called, ‘discomycosis,’ is a connective-tissue proliferation due to the inflammatory action caused by a specific organism, the *Micrococcus ascoformans*, and resulting in the formation of tumours.

Animals affected.—The horse is the only domestic animal commonly affected, but cases have been recorded in the ox and pig. Cases have been met with affecting the spermatic cord of ‘cut’ hogs, and the udder and muscular tissue of pigs and oxen.

Site of the Lesions.—In the horse the commonest situations are the stump of the cord (in castrated animals), the withers, the poll, and the subcutis of the shoulder, tail, and breast (‘harness-galls’). Occasionally the condition is found in the udder, lungs, ribs, and pleura. The lesions, probably always, start as an acute suppuration, indistinguishable from that due to *Staphylococcus aureus* ; but whilst the latter condition tends to prompt resolution, this disease has a marked tendency to become chronic. The lesion shows itself as a tumour-like mass, which when laid open is found to consist of dense white fibrous tissue, here and there containing soft centres or actual abscesses. The pus is glairy or mucoid in consistence, of a brownish tinge, and contains the discomyces granules.

The *Discomyces Granules* can be seen, in chronic cases only, by smearing a little of the pus on a glass and holding it up to the light. With a low power or with the naked eyes, these granules resemble somewhat the actinomyces granules. The outline of the granules is circular, with a crenated edge. When stained by Gram's method or Löffler's blue, they are seen to consist of masses of staphylococci embedded in a matrix.

Artificially cultivated, the discomyces is morphologically indistinguishable from the *Staphylococcus aureus*.

Botryomycosis of the Udder resembles tuberculosis of that organ. It presents hard, firm, knotty swellings which are adherent to the overlying skin. Abscesses form, burst, and discharge outwardly. In this discharging pus may be found the sand-like discomyces granules.

Judgment.—Remove and destroy the affected parts with a margin of healthy tissue. The rest of the carcase, unless emaciated, is quite fit for the market.

Glanders.

Glanders is a contagious disease of equines, caused by a specific organism (*Bacillus mallei*).

Animals affected.—Glanders affects not only horses, but donkeys, mules, and jennets. Cattle and sheep are quite immune, whilst pigs are hardly susceptible, and are never naturally attacked. Human beings can, and do, contract the disease. From a meat inspection point of view the disease is of importance only as far as horseflesh is concerned.

The *Bacillus mallei* is a tissue parasite, and never propagates outside the animal body. It is a rod-shaped, motile organism, from $1\ \mu$ to $3\ \mu$ long by $\frac{1}{4}\ \mu$ to $1\ \mu$ thick, straight or slightly curved, and with rounded ends. It is shorter and thicker than the tubercle bacillus, and is usually found in pairs.

Morphologically it is indistinguishable from accidental putrefactive bacilli. It is a difficult organism to stain,

particularly in sections; probably the best stain is Löffler's methylene blue.

In the horse, glanders may occur either as a chronic or an acute disease.

Symptoms of Chronic Glanders.—The horse frequently has a cough, is in bad condition, with a dry, rough coat, and soon becomes fatigued at work. There is usually a unilateral or bilateral dirty white nasal discharge, sometimes blood-stained, with enlarged, hard, and painful lymphatic glands under the angle of the jaw. Small nodules, varying in size from a pea to a walnut, may be found under the skin of the legs, groin, or neck, and are frequently seen discharging a sticky, brown, sanious liquid.

Symptoms of Acute Glanders.—The first noticeable signs are, often, shivering and fever (105° to 107° F.), with a nasal muco-purulent discharge, and ulcers or nodules on the nasal mucous membrane. The nodules may appear and break down into ulcers in one to three days. The breathing becomes difficult and associated with groaning, the appetite is lost, and diarrhoea sets in. The skin lesions described in the chronic form are commoner and similar in the acute form. Death results in three to fourteen days, the horse being emaciated and prostrate.

The Period of Incubation for glanders is two to seven days.

Naked-Eye Appearance of the Lesions—Lungs.—Nodules varying in size from that of a pea to that of a walnut can be felt in the lungs. They are rarely innumerable, and if numerous are usually found in both lungs. On palpation, they feel firm and shot-like. On section, recent nodules show a dark hæmorrhagic periphery, usually with a light speck in the centre. Others show a hæmorrhagic area, but are grey and translucent throughout, or grey in the outer and yellow-white in the central zones. Old nodules have a fibrous periphery, and a centre which is either dry and gritty or, occasionally, purulent.

Nasal Lesions.—The mucous membrane of the nasal cavity generally—including the sinuses—may be affected, but that on the nasal septum most frequently. The lesion

commences with an inflammatory infiltration and marked congestion, with an opaque thickening of the mucous membrane. This raised opaque area softens, the mucous membrane gives way, and an ulcer results. A typical ulcer is circular and punched-out in appearance, and has a red base covered with sanious pus. An ulcer may cicatrize, leaving a star-shaped scar, or may continue spreading till the death of the animal.

Submaxillary Lymph Gland.—If the nasal mucous membrane be affected, the submaxillary lymph gland on the same side is also usually affected. The gland becomes hard and large. If cut, it shows opaque nodules embedded in the cirrhotic gland tissue.

Skin Lesions (farcy buds) usually start as cutaneous or subcutaneous abscesses. There is an inflammatory infiltration attended by liquefaction, and the abscess bursts, discharging an oily or glairy substance. These may spread as a raw sore, and cicatrization may follow.

Judgment.—The Glanders and Farcy Order, 1907 (Section 17), compels seizure and destruction of the entire carcase.

It is doubtful whether man can contract glanders by eating meat from a glanderous carcase, but carnivorous animals no doubt do so, as is shown by its occurrence at the Zoo through feeding these animals on such meat.

The Glanders and Farcy Order, 1907.

Disposal of Carcases.

Section 17.—1. The carcase of every horse, ass, or mule, that was diseased at the time when it died, and of every animal slaughtered under this Order, shall be disposed of by the local authority as follows :

(i.) Either the local authority shall cause the carcase to be buried as soon as possible in its skin in some proper place, and to be covered with a sufficient quantity of quicklime or other disinfectant, and with not less than six feet of earth ;

(ii.) Or the local authority may, if authorized by licence of the Board, cause the carcase to be destroyed, under the inspection of the local authority, in the mode following: The carcase shall be disinfected, and shall then be taken, in charge of an officer of the local authority, to premises approved for the purpose by the Board, and shall be there destroyed by exposure to a high temperature or by chemical agents;

(iii.) Or the carcase may be disposed of in any other manner authorized by licence of the Board.

2. With a view to the execution of the foregoing provisions of this article, the local authority may make such regulations as they think fit for prohibiting or regulating the removal of any such carcase, or for securing the burial or destruction of the same.

3. Where under this article a local authority cause a carcase to be buried, they shall first cause its skin to be so slashed as to be useless.

Digging up.

Section 18.—It shall not be lawful for any person, except with the licence of an inspector of the Board, to dig up, or cause to be dug up, the carcase of any horse, ass, or mule, that has been buried.

Anthrax.

Synonyms: Splenic fever; splenic apoplexy; carbuncular fever; Cumberland disease; Persian fire; Siberian plague; holy fire; charbon; Milzbrand; Loodianah staggers.

Anthrax is a septicæmic disease caused by a specific organism, the *Bacillus anthracis*. The bacillus in the main is a blood-parasite. In a horse, ox, sheep, guinea-pig, or rabbit, dead of anthrax, the majority of the bacilli are in the blood, and not one will have passed extra-vascularly except as the result of hæmorrhage. But bacilli will be found at the site of entry into the body—*e.g.*, (1) in the case of ingestion, in the connective tissue and lymph glands of the throat, or in the intestinal wall and mesen-

teric glands; (2) in the case of inoculation, in the subcutaneous tissue and the adjacent lymph glands; but before death the blood everywhere swarms with anthrax bacilli. Occasionally an animal (particularly a pig) does die from the local lesions before general invasion of the blood has occurred. Anthrax blood coagulates badly, and does not assume the normal bright red colour on exposure to the air. Outside the animal body the anthrax bacillus thrives best in moist, boggy soil partly dried, and in loose, warm earth with organic material in it.

It has been suggested that many cases of anthrax in this country are the result of the presence of anthrax spores in



FIG. 31.—ANTHRAX BACILLI, SOME OF WHICH SHOW CAPSULES.

imported hay, foreign oats, oil-cakes, and sacks of food that have been covered with hides.

The **Anthrax Bacillus** is a non-motile, rod-shaped organism $5\ \mu$ to $20\ \mu$ long by $1\frac{1}{4}\ \mu$ thick ($\mu = \frac{1}{25000}$ inch). These rods are segmented, and may consist of two, three, four, five, or six segments, each segment being about $2\ \mu$ to $3\ \mu$ long. They can be seen in unstained films of blood or spleen pulp with a magnification of 300 to 400 (Fig. 31).

Staining Characters—1. *Gentian Violet*.—Make a blood-film on a cover-glass, and stain for five minutes with an aqueous solution of gentian violet; then dip the film into 1 per cent. acetic acid, and mount it on a drop of water. This method stains the protoplasmic part of the bacillus a deep violet, and brings into view a faintly stained envelope, which not only surrounds the segmented rods, but extends between the individual segments. This envelope is one of

the distinguishing characteristics between anthrax bacilli and otherwise similar putrefactive organisms.

2. *Methylene Blue*.—In blood-films stained with methylene blue the envelope is invisible, and each segment will be seen to have square-cut or slightly concave ends. This is the stain commonly used for examining blood for anthrax bacilli.

3. *Gram's Stain*.—Anthrax bacilli can with care be stained by this method also.

Sporulation.—Anthrax bacilli require warmth (64° to 107° F.) and free exposure to oxygen in order to sporulate; for this reason the bacilli in the blood and tissues never sporulate, but, in blood spilt on the ground, will do so if the temperature is high enough. Having sporulated, the bacillus is very resistive to changes of temperature, and may be found virulent twenty years later. When sporulating, a granular, opaque, refractile speck appears in the protoplasm of the bacillus, and continues growing till it completely fills the envelope of the bacillus. The spore is set free by dissolution of its enclosing envelope.

Animals affected.—All domestic animals are occasionally attacked with anthrax. In this country, most diagnosed cases are in cattle, but from experiments it appears that sheep are more susceptible and die more quickly. Pigs, goats, and horses, are also readily attacked, whilst man is occasionally the subject of the disease.

There are good reasons for believing that in many cases cattle with anthrax recover.

Symptoms.—Frequently the animal, particularly in the case of sheep, is found dead. The symptoms, if observed, are those of fever, lassitude, salivation, refusal of food, colic (rolling and kicking), giddiness, and restlessness. There is frequently hæmorrhage from the mucous membranes of nose and rectum, and occasionally carbuncles and patchy œdema of the skin. Affected animals are frequently butted to death by others in the field. In pigs there is marked swelling around the throat, which renders swallowing difficult and breathing laboured.

Methods of Infection.—In *horses, cattle, and sheep*, infection is usually the result of ingesting anthrax spores with the food or water. In this country, infection of the lower animals by inhalation or inoculation is very rare; but probably in the tropics flies act as a medium of infection, and transmit the disease by inoculation.

In *man*, infection by inoculation (malignant pustule) is far from rare, and is seen in butchers, knackers, farm labourers, and hide-porters at the docks. It is, however, also commonly effected by inhalation (woolsorter's disease). Infection by ingestion is only occasionally seen, for flesh rarely contains spores (owing to the temperature of the meat usually being too low to allow of sporulation), whilst both cooking and the process of digestion (gastric juice) will destroy the bacilli.

In *pigs* the disease is usually contracted by eating the raw flesh and offal of animals that have died from anthrax.

The Period of Incubation in cattle and sheep when infected by ingestion is usually two or three days, and death usually occurs within a few minutes or an hour of the first symptom. It is not surprising, therefore, that large numbers, never seen ill, are suddenly found dead. In pigs the period of incubation is about one or two days, and death occurs within the twenty-four hours following the first symptom.

The Lesions in Cattle and Sheep.—The animal is usually found dead, and putrefaction sets in so rapidly that in an hour or so the abdomen is intensely tympanitic. (The blood is so de-oxygenized that the anaerobic putrefactive bacilli multiply with unusual rapidity.) At the same time, the anus is usually everted, and has a dark, sanious liquid oozing from it. A frothy, blood-stained discharge is also frequently found escaping from the nostrils. Under these circumstances one should suspect anthrax, and on no account should a post-mortem examination be made until the blood has been examined for anthrax bacilli. If the result of the blood-examination is positive, the carcass must be dealt with according to the regulations laid down by the

Board of Agriculture, and no post-mortem examination must be made.

In unsuspected cases in which a post-mortem is made, or in animals suffering from anthrax and slaughtered for food, the following pathological changes will be found :

Skin.—The subcutaneous veins are engorged with tarry-looking blood, and there may be a few ecchymoses, but œdematous swellings are rare. The skin about the loins, buttocks, and shoulders, has the appearance of being bruised.

Flesh.—The flesh as a whole is paler than normal, but where hæmorrhages have occurred it is very soft, and in colour dark brownish-red or violet.

Intestines.—There is a marked gastro-enteritis, with enlarged, congested lymph glands, which on section resemble blood-clots. There is often a gelatinous œdema of the tissues around these glands. The intestinal wall is œdematous, and in places transparent and fiery, showing the extravasated blood in the lumen of the bowel. Occasionally there are subserous hæmorrhages.

Spleen.—This is enlarged and blackish in colour. Its contents fluctuate beneath the capsule, and on incision through this, a thick dark fluid oozes out. Occasionally rupture of a spleen in this condition occurs before death. So constant and characteristic are these changes in the spleen that, when found, the post-mortem examination should be stopped at once and the blood examined for anthrax bacilli. Such a spleen may weigh 20 to 30 pounds. On only very rare occasions in anthrax is the spleen normal. Occasionally an enlarged spleen not due to anthrax is met with. These changes in the spleen are not so marked in sheep as in cattle.

Beyond the tarry congestion, the other organs show only parenchymatous degeneration, and perhaps small hæmorrhages. Gelatinous infiltration of the tissues round the throat may be found in cattle, but is rare in sheep.

Anthrax Lesions in the Pig.—If seen before death, the pig frequently shows difficulty in swallowing, regurgitation of

its food, and dyspnoea. In the majority of cases there is marked swelling of the throat and neck, which on section is found to be due to infiltration of the tissues with a clear gelatinous exudate. The adjoining lymphatic glands are then swollen and congested. These lesions and the history of having been fed on raw flesh are to all intents and purposes diagnostic, but for confirmation the blood should be examined for anthrax bacilli. Enlargement of the spleen and intestinal changes are not constant, but when found are similar to those of the ox.

Anthrax Lesions in the Horse are similar to those found in cattle. The changes in the spleen are not so constant, and when present are not so marked. Infiltration of the tissues round the throat is more frequent than in cattle.

The Examination of an Anthrax Carcase.—The making of a post-mortem examination and the shedding of the blood of anthrax animals is, if possible, to be avoided, because of the danger to the person making the examination, and of bringing about sporulation of the bacilli. In this country, throughout the greater part of the year sporulation under natural circumstances is impossible, because the temperature is too low. In examining a suspected carcase, it is usually the blood from the ear that is examined. This plan causes little or no spilling of blood, and the ear, being at the most remote part of the body, is the last to be invaded by the putrefactive bacilli that so closely resemble those of anthrax.

Judgment.—The Board of Agriculture Anthrax Order, 1910, requires destruction by heat, or burial of the carcase in lime, and quarantine of the infected area.

RÉSUMÉ OF THE ANTHRAX ORDER, 1910.¹

Section 2.—1. Anyone possessing or in charge of an animal or carcase affected with (or suspected of) anthrax shall at once inform a police-constable of that district.

¹ The Anthrax Order, 1910, is given in full at the end of the book with the Public Health Acts.

2. The constable at once informs an inspector of the local authority, who informs the L.A.

3. The inspector of the L.A. immediately notifies the medical officer of health of the district.

Section 3.—1. The occupier of premises containing a case of anthrax shall (until served with Form B)—(1) prevent access of animals or fowls to carcase, animal, or possibly infectious premises; (2) detain on the premises all animals suspected of the disease or that have been in the same shed, stable, yard, or field.

If anthrax was erroneously certified, a certificate to that effect removes the above restrictions.

2. Any place where blood from a carcase or animal is spilt, or where either has lain, must be disinfected by chloride of lime.

Section 4.—1. As soon as notified, the inspector of the L.A. shall proceed to the place.

2. The inspector shall serve Form C on the occupier of the premises (this form contains instruction similar to Section 3).

Section 5.—1. The L.A., when informed, instructs the veterinary surgeon to inspect.

2. The owner and occupier must assist the L.A. in its inquiries.

3. The veterinary surgeon, if satisfied that it is not anthrax, gives a certificate to the L.A., who serve occupier with Form D (revoking Form C).

4. The veterinary surgeon certifies to the L.A. 'suspected anthrax,' and forwards blood-films to the Board of Agriculture, who certify 'yes' or 'no.'

Section 6.—On the certificate of a veterinary surgeon, the L.A. has the premises disinfected and the carcase destroyed.

Section 7.—1. On receiving a certificate from the B. of A., the L.A. issues Form A (*i.e.*, infected area, Section 9) to occupier.

2. The L.A. may serve Form A on occupier of any premises believed to have been infected by the animal in question.

3. Form A remains in force till revoked by Form B.

5. Form A shall not be served on a market-place, fair-ground, sale-yard, or slaughterhouse, except by order of the B. of A.

Section 8.—A copy of any notice served under this order must be forwarded to the Secretary of the B. of A., to the police-officer in charge of the district, and to the M.O.H.

Section 9.—1. No animal must gain access to an anthrax animal or carcase, or possibly infectious premises.

2. No animal may quit an infected area without permission.

3. Any horse, ass, mule, or dog, not 'diseased' may quit infected area.

4. Any animal not 'diseased' may quit an infected area for immediate slaughter at the nearest slaughterhouse, or be removed to another area after written permission from an inspector, and subsequent delivery of Form A at new abode.

5. No litter, dung, fodder, tools, hurdles, etc., may be removed from an infected area except after written permission from an inspector of L.A.

Section 10.—1. (1) The L.A. may cause the carcase to be burnt on the premises or nearest suitable premises.

(2) By licence from B. of A., the L.A. may have the carcase disinfected, and then carried to some premises for destruction by fire or chemicals.

(3) If (1) or (2) is not possible, the carcase shall be buried in its skin, in a suitable place, free from the access of animals and removed from any house, well, or stream, 6 feet below the surface, with 1 foot of lime below and 1 foot above the carcase.

2. A 'diseased' or suspected carcase shall not be destroyed or buried except by order of L.A.

3. Before removal for burial, plug the natural orifices with tow soaked in carbolic acid, and make no incision into the skin.

4. Gives permission to remove the carcase for burial in another district.

Section 11.—Milk from an anthrax animal must not be

mixed with the rest of the milk, but boiled, and the utensil used must be subsequently boiled in water.

Section 12.—After burial the carcase must not be dug up without a licence from the B. of A.

Section 13.—1. The L.A. at its own expense shall disinfect the shed, field, utensils, etc., used by, or in contact with, the diseased animal.

2 and 3. The walls shall be soaked with 4 per cent. carbolic acid, and if possible scraped. The scraping shall be burnt or buried in lime, and the disinfectant reapplied.

Section 14.—1. All reasonable facilities for cleansing and disinfecting shall be given by the occupier to the L.A.

2. The L.A. may order occupier to cleanse and disinfect the premises (but not at his own expense).

Section 15.—It is not lawful to bring an anthrax animal in contact, directly or indirectly, with other animals, whether in a market, road, field, canal, etc., except under the direction of an inspector as the Act provides.

Section 18.—Weekly returns of all particulars concerning an infected area are to be made to the B. of A.

Black-Quarter.

Synonyms : Quarter-evil; black-leg; symptomatic anthrax.

This is an inoculable disease caused by a specific organism—the bacillus of black-quarter.

Animals affected.—The only animals commonly subject to the disease are cattle and sheep, chiefly cattle. In these it rarely, if ever, attacks animals of more than four years of age, but usually selects those of six to eighteen months. Sheep, on the other hand, are affected indiscriminately at any age. Cases of the disease have been recorded in the goat, pig, and horse, but are not common in any of these. Dogs, fowls, and man, are immune.

The **Black-Quarter Bacillus** is mainly a tissue parasite, and is found in large numbers in the emphysematous swelling that is characteristic of the disease. In this swelling it may be found in the œdematous fluid, the

connective tissues, and the muscular fibres. The spleen and blood contain very few, even after death; but their presence may be shown there by inoculation experiments. The organism is rod-shaped, slightly smaller than the *Bacillus anthracis* ($3\ \mu$ to $4\ \mu$ by $0.75\ \mu$), and has round ends (almost pointed), and it is rare to find more than two or three end to end, whilst actual filaments never form. It is motile, and sporulates both during the life and after the death of its host. The spores are usually central, occasionally terminal, and always distend the bacillus. It stains with the ordinary simple dyes, but not by Gram's method.

Lesions.—The characteristic lesion is an inflammatory swelling in any part of the body, but most frequently in the muscular portions of the fore or hind quarter. This swelling forms with great rapidity, and soon becomes emphysematous and crackles when palpated. Later the skin over the swelling becomes dry and parchment-like, and eventually sloughs off. In sheep the swelling is easily overlooked, because of the wool, but while still alive the wool pulls out easily, allowing a dark-coloured watery fluid to escape. The swelling is due partly to gas formation, and partly to inflammatory oedema, which is most marked at the periphery of the swelling. The muscular tissue may also be saturated with watery, blood-tinged liquid; but where the gas formation is most abundant the muscle is dry. When cut across, the muscular tissue is dark red and stringy, and has a characteristic porous appearance due to the separation of muscle fibres by the gas. The fresh lesion, particularly when the flesh is warmed, has a peculiar odour, which resembles rancid butter, but putrefaction progresses so rapidly after death that the sour odour is soon masked.

There is occasionally a blood-tinged liquid in the pleural cavity and peritoneum, both of which contain the organism. The blood-clots are firm and stiff, and the spleen is usually normal. The lymphatic glands in the neighbourhood of a black-quarter lesion are enlarged, oedematous, and hæmorrhagic.

Judgment.—No ill effects to man through eating the flesh have ever been recorded, but on account of the odour and the rapid onset of putrefaction the entire carcase should be seized.

Swine Erysipelas (Mal Rouge).

This is a disease of the pig caused by a specific organism. It rarely occurs in pigs less than three months old, and usually affects the better breeds. In this country it is sporadic in origin, and apparently the organism has its natural habitat in the soil. In the pig it is a true septicæmia, the organism being found in the blood and spleen. In chronic cases its principal habitat is the vegetation on the valves of the heart.

It is a formidable plague amongst pigs in Europe, particularly France and Germany.

The Organism is a small, slender, cylindrical bacillus about 1μ to 2μ long. The bacilli are usually single in the blood, but occur in short threads when found in the tissues. The rods are straight, non-motile, and do not sporulate. They stain easily with the ordinary simple dyes, and also by Gram's method.

Artificial cultures grow at summer or body temperature in either the presence or absence of oxygen. The most typical growth is obtained on gelatine plates, small colonies forming with a spider-like appearance. Stab cultures of gelatine show no growth near the surface, but in the deeper layers a fine growth occurs, the whole being aptly described as like a fine tube-brush or pipe-cleaner. The gelatine is not liquefied.

Animals attacked.—The pig is the only animal naturally attacked, but mice, pigeons, rabbits, and fowls, are susceptible. In the acute cases in pigs it is fatal, in two or three days the disease killing 50 per cent.

Lesions.—1. In acute cases the skin is œdematous and darkly congested (almost violet). There is acute gastro-enteritis without ulceration, subserous hæmorrhages, en-

largement and softening of the spleen, and enlarged hæmorrhagic lymphatic glands. Hæmorrhagic nephritis is never absent. Rigor mortis is almost absent, and putrefaction soon sets in. The flesh, unless actually hæmorrhagic, is paler than normal, soapy, flaccid, and œdematous.

2. In chronic cases, which may cause death some months after the acute attack, the valves of the heart (particularly the mitral valves) are covered with soft, very friable greyish deposits, which swarm with the causal organism.

Acute swine erysipelas is rare in Great Britain, where the disease is usually chronic.

Method of Infection.—Infection is probably always by ingestion.

Symptoms.—If seen during life, the pig will appear feeble and depressed, and will show dark red discoloration of the skin. This first appears in isolated spots, but rapidly spreads over the whole body.

Judgment.—The disease is not transmissible to man, and if marketable in appearance the carcase may be passed. It, however, putrefies rapidly, and the time that has elapsed since slaughter should be considered. The offal and trimmings should be destroyed, to prevent their being used to feed pigs, and thus starting a fresh centre. Ordinary cooking does not destroy the organism (Petri).

Swine Fever (American Hog Cholera).

The causal organism of this disease is believed to be so small that the present powers of magnification by the microscope are insufficient to bring it into view. The pig is the only animal commonly attacked, and the other domestic animals are almost immune.

Lesions.—In the very acute cases which are fatal in two or three days (as may occur in very young animals), the only lesion frequently present is an intense inflammation of the stomach and intestines. But in the majority of cases characteristic lesions may always be found in the large intestine, and frequently in the small intestine also. Any

PLATE VI.

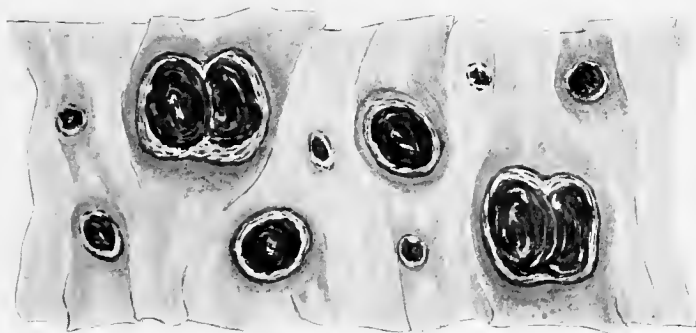


FIG. 32.—SWINE FEVER (LARGE INTESTINE), SHOWING EXTENSIVE HEAPED-UP NECROTIC LESIONS RESULTING FROM SECONDARY INFECTION WITH THE NECROSIS BACILLUS.

To face page 216.

part of the intestine may be affected, but the commonest situation is within 2 or 3 feet of the cæcum. Two distinct types are to be recognized—(1) ulcerative lesions, (2) diphtheritic lesions.

Ulcerative lesions are by far the most frequent, and are usually found in the large intestine. This so-called 'ulcer' varies in size up to that of a penny. It commences about the size of a pea, and spreads outwards circularly. It is usually greyish in colour, or bile-stained, but occasionally is almost black. It is flat and often shows concentric rings of a firm, dry material, and is about level with, or a little higher than, the normal mucous membrane (Fig. 32). There may be scores of such ulcers, or only a few. In the latter case they are usually near the ileo-cæcal valve. Ulcers may be found occasionally in the small intestine, stomach, mouth, or pharynx, but in such situations are rare. They seldom extend deeply into the intestinal wall, and perforation, with subsequent peritonitis, is almost unknown. In process of time the dead tissue may be detached as a slough, leaving a genuine ulcer, which when healed leaves a smooth depressed scar. Occasionally the slough is not detached, and a chronic inflammatory connective tissue forms at its base, and pushes the slough as a conical projection into the lumen of the bowel.

The Diphtheritic lesion is a more or less diffuse inflammation of the intestinal mucous membrane, attended with coagulation and subsequent adhesion of a brownish-yellow fibrinous exudate on its surface. This condition is usually associated with superficial necrosis of the mucous membrane. These diphtheritic areas are rarely extensive, but occur usually in scattered patches. The most frequent seat of the lesion is the last few feet of ileum, but the large intestine is occasionally affected. The diphtheritic deposits are not removed by gentle washing in water.

Changes in the Lymphatic Glands.—The mesenteric lymph glands are swollen and congested, and in very acute cases the lymphatic glands in any part of the body are in a similar condition.

Lesions in the Lungs.—In rare cases a genuine swine fever pneumonia may be present, with large areas of necrosis. It is not uncommon, however, in large outbreaks to find an ordinary lobar pneumonia.

The **Pleura** is sometimes inflamed, and its cavity may contain a clear or blood-stained fluid.

The **Liver** is usually unchanged in its naked-eye appearance, but occasionally shows multiple areas of necrosis which may be mistaken for tuberculosis.

The **Spleen** is also usually unchanged, but, like the liver, may show necrotic patches.

The **Kidneys** show nothing characteristic, and are often normal; but occasionally small hæmorrhages may be found in the kidney substance or in the pelvis of the kidney.

The Skin.—In many cases of swine fever there is some discoloration of the skin, chiefly about the ears and inner side of the thighs. This bluish-red discoloration may be diffuse or may be punctiform. Discoloration of the skin is not so constant in swine fever as in swine erysipelas. There is no recognizable swelling of the skin.

Symptoms.—Both an acute and a chronic form of swine fever are recognized. The *acute* form occurs usually in young pigs, and is generally fatal in three days. The temperature is high (105° F.) and the breathing rapid. If made to walk, weakness of the hind-quarters causes the pig to stagger. A red rash appears on the skin of the belly, inside the thigh, round the base of the tail, and upon the ears. The *chronic* form has a more gradual onset. The affected pigs become dull, lose their appetite, are disinclined to move, and lie about in corners or under cover. The temperature is high (104° F.). They frequently vomit and have constipation at the commencement, followed by blood-stained diarrhœa. The skin around the base of the tail, inside the thighs, on the belly and ears, develops a red rash, which later turns purplish in colour. When roused and made to walk, they stagger, and their hind-quarters roll from side to side. Their breathing often becomes laboured

and is accompanied by a sharp cough. Death usually occurs in one to three weeks, but occasionally pigs exist for two to three months, by which time they are greatly emaciated.

Judgment.—Swine fever is not transmissible to man, and if the animal is killed early, the carcass appears quite normal, and sets firmly. The slightest evidence of swine fever in the carcass, however, brings it under the Swine Fever Order, 1908, which in Section 6 forbids the use of the flesh as food and enforces the destruction of the carcass.

The Swine Fever Order, 1908, is given at the end of the book, after the Public Health Acts.

Swine Plague (Schweine-Seuche).

This is an epizootic disease of pigs which is very rife in Germany, but has not been recognized in Great Britain.

A specific **Organism** has been described, which is a tissue parasite capable of multiplying outside the animal body. Cases may therefore be sporadic. The organism belongs to the fowl cholera type. It is small and almost oval, with rounded ends, and is not motile. When stained, its ends take up the stain more readily than does the rest of the organism, with the result that a central unstained belt remains. More distinctly rod-shaped and somewhat larger organisms are also usually present in the lesions. The swine plague bacillus is easily destroyed by heat and disinfectants, and, like other organisms of the fowl cholera type, it does not stain by Gram's method.

Animals affected.—The pig is the only animal commonly attacked, but the rabbit is very susceptible, and usually dies in one to two days after inoculation; enormous numbers of the bacilli may then be found in the blood.

Lesions.—The lesion described as characteristic is a pneumonia, accompanied by areas of pulmonary necrosis and a fibrinous pleurisy, usually with a little fluid. Most of the cases of pneumonia occurring in swine fever are of

this type, the responsible organism of which is indistinguishable from the German organism described above. Apart from swine fever, the occasional cases of pneumonia met with in the pig are most of them caused by a similar organism, which is quite common among dirt bacteria and so-called 'septic organisms.' An unimportant gastro-enteritis is also occasionally said to be present in swine plague, and a discoloration of the skin similar to that of swine fever has been recorded.

Judgment.—This disease has never been known to be transmitted to man in Germany, although ample opportunity has probably been present. Ostertag, however, advises entire confiscation of the carcase.

Parturient Fever.

This term, as frequently applied, includes two distinct diseases with nothing in common except their occurrence shortly after parturition. These two diseases are—

1. Septic parturient fever (see Septic Metritis), which is a condition associated with decomposing uterine contents.

2. Parturient paralysis (parturient apoplexy or milk fever), which is an intoxication or poisoning producing paralysis, and unassociated with any apparent uterine abnormality.

Milk Fever, as it is most commonly called, may occur immediately before parturition, but appears usually one to three days afterwards. It most frequently affects cattle, particularly fat, overfed animals that get no exercise. It, however, occasionally affects sows and goats. It is not associated with any difficulty in the parturition.

Symptoms.—Often, without any warning, there is a sudden rise in temperature, accompanied by restlessness and blowing, followed by rolling of the eyes and tottering of the hind-quarters whilst walking. This weakness behind soon becomes a paralysis, which spreads forwards to other parts of the body, leaving the animal eventually with paralysis of the intestines and bladder, and in a state

of coma. Recovery occasionally occurs rapidly, but many of the animals die.

Etiology.—The cause of parturient fever is still undecided, though many suggestions, such as intoxication from the udder, a fat embolism in a cerebral artery, etc., have been brought forward.

Post-Mortem Examination reveals no gross anatomical changes which are pathognomonic of the disease, in the uterus, udder, or any part of the body. There is frequently congestion of the meninges of the brain; and if the animal has been 'down' a day or so before slaughter, there is usually marked œdema of the parts laid upon, and perhaps areas of necrosis in the skin (bed-sores). If the animal has been slaughtered early, there may be no abnormal appearance of the flesh, but in the later stages the carcass appears badly bled, the flesh is dark and congested, and the dependent parts are œdematous.

Judgment.—The meat has never been known to cause illness when eaten, and animals slaughtered at the onset of the disease, and showing no changes in the flesh, are often allowed into the market with full knowledge of the circumstances. In the later stages the changes in the carcass are sufficient to make it unmarketable, and it should be condemned.

Bacillary Necrosis.

Under this heading will be discussed a few different lesions that are caused by the same organism—the necrosis bacillus. It is not intended to include here all cases of necrosis caused by bacteria, such as tuberculosis, swine fever, etc., nor is it intended to include the necrosis that results from injuries and interference with nutrition not of bacterial origin.

The **Necrosis Bacillus** has its natural habitat in the soil, but when pathogenic it may be found in the lesions it causes. There it generally takes the form of long slender filaments composed of ten to twenty rods, each about $3\ \mu$ to

4 μ by 0.8 μ in size. It is an organism difficult to stain, but this can be effected with Löffler's alkaline methylene blue, though not by Gram's method. It is strictly anaerobic, and is found in the blood only whilst being transported.

Animals affected.—The horse, ox, sheep, and rabbit, are all occasionally attacked.

The **Liver of the Ox** is one of the organs most commonly affected. Nodules varying in size from that of a walnut downwards, and readily mistaken for new growths, are occasionally found. The nodule, if recent, is yellowish or dirty white, and is firmer, drier, and tougher, than is the normal liver. It cuts with a smooth surface, which still shows traces of the normal lobulation. The rest of the liver is often undergoing fatty degeneration, and the line of demarcation is definite. Microscopically all the normal elements may be recognizable in a nodule of necrosis, but are swollen, and their nuclei do not stain. If a section be properly stained, numerous filaments will be found at the periphery of the nodule, where they are invading the liver tissue. Older nodules may be found, encapsuled with fibrous tissue, and undergoing central softening prior to absorption.

Similar lesions due to this organism are occasionally found in the livers of calves and lambs a few weeks old, that have been suffering from navel-ill; and in the same animals necrotic areas may be found in the lungs.

Calf Diphtheria, or Ulcerative Stomatitis of the calf, is due to the necrosis bacillus. In this condition the tongue, cheek, and throat, are mainly affected. The disease often starts as a pure necrosis, and half the tongue may be found dead, probably owing to inoculation through the mucous membrane. In other cases, areas of necrosis may be found inside the cheeks or on the tongue or pharynx. In some cases it appears to spread from calf to calf by means of the feeding utensils.

Judgment.—In the case of the liver the whole organ should be seized. When the so-called 'calf diphtheria'

exists, the inspector, guided by its extent, must use his discretion whether to seize the whole head or only the affected tongue.

Malignant Œdema.

This is a disease of the lower animals caused by the bacillus of malignant œdema (Koch). The same organism in human pathology causes spreading gangrene and traumatic gangrene, conditions rarely seen at the present time.

Animals affected.—Malignant œdema is rarely seen in the lower animals in this country, but cases have been recorded in horses, cattle, sheep, and pigs. All animals are susceptible, and can be infected experimentally. The natural method of infection is by inoculation, and is usually the result of wound infection.

The Organism is a constant inhabitant of the soil and of the alimentary canal of herbivora. Within a few hours of death it may always be found in large quantities in the blood, having spread up the vessels from the stomach and intestines. When it becomes pathogenic it is found in the tissues, but in the blood not till after death. In the tissues the pathogenic organism occurs as long rods ($4\ \mu$ to $5\ \mu$ by $1\ \mu$), or as actual filaments, many of which resemble in appearance the *Bacillus anthracis*. On account of their rapid appearance in the blood after death, the distinction between the two organisms is of some importance. In the case of anthrax, the bacilli will be found in perfectly fresh blood, but commencing putrefaction precedes the appearance of malignant œdema bacilli in the blood. Malignant œdema bacilli also differ from those of anthrax in being motile; by the ends of the rods being round; by having no distinct envelope; by staining more intensely with methylene blue and other basic aniline dyes; by the filaments consisting of segments of variable length; by not staining with Gram's method; and by sporulating in the blood in the interior of the body after death.

Differentiation between the two organisms is sometimes

difficult if the blood is not quite fresh and a high magnification is not used.

The **Lesions** are usually confined to the seat of infection, or thereabouts. A superficial œdematous swelling containing blood-tinged fluid forms, and goes on to gangrene and emphysema of the neighbouring tissues. Internal lesions are unimportant, but the spleen is often slightly enlarged, and the membranes are frequently spotted with small hæmorrhages.

Judgment.—Seize the whole carcase, for multiplication and spread of the organism is very rapid after death, and the carcase soon becomes ‘fevered’ in appearance, repulsive, and putrid.

Malignant Catarrh.

This disease of cattle is thought to be due to a necrosis bacillus. Malignant catarrh is usually sporadic, but occasionally spreads among cattle herded together, as on board ship.

Animals affected.—Cattle and sheep are the only animals known to suffer, and it is not communicable to man.

Symptoms.—The affected animal is listless and refuses its food. The eyelids and face become puffy, and a stream of saliva is usually to be seen running from the half-open mouth. There is commonly a foetid discharge from the nostrils, which is often blood-stained, and may contain sloughs of nasal mucous membrane. The urine is frequently blood-stained, and dysenteric symptoms are common. The temperature keeps high (105° to 107° F.) throughout, and in the later stages the horns may slough off.

Lesions in Cattle.—In mild cases there may be only congestion of the nasal mucous membranes, with discharge on the surface and around the nostril, and slight conjunctivitis with œdema of the eyelids. The membranes of the mouth, stomach, and intestines, are slightly congested. In advanced cases the mucous membranes of the nasal cavity and sinuses are ulcerated and suppurating, with a foul odour. The eyes show opacities of the cornea, iritis,

and hæmorrhage into the anterior chamber. Superficial erosions are present on the mucous membrane of the lips, gums, and tongue. The stomach and intestines present an inflamed, ecchymosed mucous membrane, with blood-stained contents, and swollen congested Peyer's patches and glands. The bladder often contains blood-stained urine. The muscles show small hæmorrhages. Similar but not quite so extensive lesions are found in sheep suffering from, probably, the same disease.

Judgment.—No bad effects have ever been recorded in man through ingesting the flesh of such animals. In advanced cases the flesh is 'fevered,' has small intramuscular hæmorrhages, and is repulsive to look at. In both the mild and severe cases putrefaction sets in rapidly.

If the animal was killed in an early stage, and the flesh is not altered in appearance, the carcass may be allowed into the market; otherwise the entire carcass should be seized.

Braxy.

There is a recognized infectious disease of sheep, called 'braxy,' which runs an acute course, and is most frequent in wintry weather. But in parts of Scotland the term 'braxy' is also applied very loosely, and includes most sheep that have died suddenly from some unknown cause. The true or infectious braxy is very common in parts of Norway and Iceland, and is there called by the name of 'bradsot,' or 'brusot.'

In the North of England and the Highlands of Scotland, though still common, braxy is less frequent than it was twenty to thirty years ago.

Animals affected.—It occurs in sheep, usually, under two years old. The calf and pig appear immune to natural infection, though experimentally susceptible. The disease resembles black-quarter very closely, both clinically and at the post-mortem examination, but differs in that black-quarter cannot be experimentally transmitted to pigeons or fowls, whereas braxy can be so transmitted.

The **Organism** of braxy is identical with that of black-quarter (Jensen), with the above exceptions, and can be most easily demonstrated in the œdematous fluid found in the wall of the fourth stomach and in the pleural and peritoneal cavities.

Lesions.—As in black-quarter, the subcutaneous and muscular tissues are sodden with blood-stained, œdematous fluid, and contain small quantities of gas which cause the skin to crackle on palpation. The wool over such areas is readily detached. The walls of the intestine and stomach (particularly the fourth stomach) are thickened and gelatinous, and show dark red spots on the surface. The flesh has an odour resembling rancid butter. The disease runs a rapid course; the animal, when taken ill, lies down, and soon dies, and putrefaction is so rapid that within an hour or so the body is distended and tympanitic.

Sick animals are frequently slaughtered by bleeding as soon as their condition is noticed, so that the flesh may be sold.

Judgment.—The odour and appearance make the carcass unmarketable, although, unless putrid, it is as food harmless to man. In parts of Argyllshire it is customary to salt and dry braxy mutton, which is there considered a delicacy. But this is a custom that should not be encouraged, as some of the cases of so-called ‘braxy’ are probably anthrax.

Cow-Pox (*Variola Vaccinia*).

Cow-pox is a very mild disease, and rarely affects, to any noticeable extent, the general health of the cow. The disease is probably transmitted by the hand from cow to cow through inoculation during the process of milking. It is transmissible to man, and calves are purposely infected with cow-pox, in order to obtain the serum for vaccinating man against small-pox.

Symptoms.—The first thing noticed is, usually, that the cow is restless during ‘milking’; subsequently, the teats

become swollen and red, and later hard nodules, the size of millet-seeds, can be felt. Several of these nodules fuse, and form vesicles containing a clear serous fluid; a few days later the vesicles become pustules, and finally hæmorrhagic crusts are formed from the pustules. During its whole course of about three weeks, the disease is usually accompanied by slight fever and a diminution in the milk-supply.

Lesions.—On the teats the lesions are seen either as elliptical vesicles or black scabs, whilst on the udder they are usually circular. When the scab falls off, a slight superficial scar remains. The only condition likely to be mistaken for this is ‘chapped teats,’ but the lesions are then horizontal across the teat and in the form of fissures.

Judgment.—The milk from a cow suffering from cow-pox must not be used for human food, but the meat is quite wholesome, and may be permitted into the market.

Sheep-Pox (*Variola Ovina*).

Sheep-pox is exotic in Great Britain, where it is seen only at the ports. It is extremely fatal, for even in the mild or discrete form 25 per cent. of the affected animals die, whilst in the malignant or confluent form the percentage of deaths may reach 90.

The Period of Incubation is about seven days.

Symptoms.—There is great systemic disturbance, accompanied by coughing, disturbed breathing, salivation, and discharge from the nose and eyes. Swallowing often becomes difficult, and there is always high fever (105° F.). Besides these general symptoms, there is a well-marked characteristic eruption of the skin. This eruption first appears in the form of red pimples, usually in the bald skin of the belly, armpits, thighs, and around the mouth, eyes, and nostrils. In one or two days these papules become vesicles, with flat tops about the size of a three-penny or sixpenny bit. These vesicles suppurate and form pustules, which in three or four days from the commence-

ment of the disease have formed crusts or black scabs. Similar lesions may be found in the woolly parts, but are rare except in the confluent form, when the whole body becomes covered with large black scabs.

Lesions.—Similar lesions may be found in the lungs, bronchioles, trachea, and pharynx, whilst small congested or hæmorrhagic areas may be found in the subcutis, underlying the skin lesions.

Judgment.—In Germany, if the disease has run a mild course the meat is allowed into the market, but in the confluent form where there is sepsis and pyæmia, the meat is considered dangerous, and is seized.

In Great Britain the Sheep-Pox Order of 1895, Section 8, requires that the carcass shall either be buried in lime 6 feet below the surface, or else destroyed by high temperature or chemicals.

The Sheep-Pox Order, 1895.—

Disposal of Carcasses.

Section 8.—1. The carcass of a sheep which at the time of its death was affected with or suspected of sheep-pox shall be disposed of by the local authority as follows:

(i.) Either the local authority shall cause the carcass to be buried as soon as possible in its skin in some proper place at a depth of not less than six feet below the surface of the earth, and to be covered with a sufficient quantity of quicklime or other disinfectant;

(ii.) Or the local authority may, if authorized by licence of the Board, cause the carcass to be destroyed, under the inspection of the local authority, in the mode following: The carcass shall be disinfected, and shall then be taken, in charge of an officer of the local authority, to a horse-slaughterer's or knacker's yard approved for the purpose by the Board, or other place so approved, and shall be there destroyed by exposure to a high temperature or by chemical agents.

2. With the view to the execution of the foregoing provisions of this article, the local authority may make

such regulations as they think fit for prohibiting or regulating the removal of carcases, or for securing the burial or destruction of the same.

3. Where under this article a local authority cause a carcase to be buried, they shall first cause the skin to be so slashed as to be useless.

4. A local authority may cause or allow a carcase to be taken into the district of another local authority to be buried or destroyed, with the previous consent of that local authority, but not otherwise.

Digging up.

Section 9.—It shall not be lawful for any person, except with the licence of the Board or permission in writing of an inspector of the Board, to dig up, or cause to be dug up, the carcase of any sheep that has been buried.



FIG. 33.—TETANUS BACILLI, SOME OF WHICH POSSESS SPORES. $\times 1,000$.

Tetanus (Lockjaw).

This disease is caused by a specific organism—the tetanus bacillus.

Animals affected.—All the food animals and man are susceptible. It is, however, most frequent in horses, but occurs in sheep after docking and castration, and in cattle after parturition. New-born lambs are also occasionally affected through the raw navel. Infection takes place by inoculation.

The **Tetanus Bacillus** under normal circumstances leads a saprophytic existence in the soil, but when inoculated into an animal it becomes a typical tissue parasite. The

bacilli are confined to the site of inoculation, where they multiply, and at the same time produce a violent toxin which is the cause of the characteristic symptoms of this disease.

Morphology.—The bacillus occurs in the form of slender rods, usually straight, with convex ends. It is motile and sporulates. The spore is terminal and wider than the bacillus, and produces a resemblance to a miniature drum-stick. The bacillus stains by Gram's method.

The tetanus bacillus is usually associated with suppuration of the wound; but occasionally no wound can be found, and it is on these occasions that infection by ingestion is suggested where there is a scratched or abraded mucous membrane of the alimentary tract.

Symptoms.—The disease is rarely seen in the slaughter-house except in horses. Attention is drawn by the stiffness of the limbs during movement. The nose is poked out, the nostrils dilated, the head extended, and the jaw fixed. The tail is usually elevated. The muscles of the neck are stiff and board-like. When approached, there is a sudden shivering spasm associated with a frightened look and sudden stiffening of the affected muscles. It is a picture which, once seen, is never forgotten.

Judgment.—Sormani considers the flesh absolutely harmless when eaten. According to Fermi and Celli, the gastric juice renders inactive any tetanus toxin that may be present in the flesh. The meat may perhaps be considered as not injurious to health. It is, however, a spoiled food, and the carcase is usually inefficiently bled. The disease is so rare in the usual food animals that it is advisable, in spite of its alleged harmlessness, to condemn the whole carcase, and thus avoid the possible risk of any unfortunate results.

Cattle Plague (Rinderpest).

This is a contagious disease of cattle, the causal agent of which has not yet been discovered. It affects not only cattle, but occasionally sheep and goats. Man, however, is immune, and so is the horse.

The blood of animals suffering from the disease contains the virus, and is capable of infecting susceptible animals.

The disease has been extinct in Great Britain for some years, but is indigenous to Asia, Central Europe, and Central and Southern Russia.

Lesions.—The characteristic lesions occur in the alimentary tract, and occasionally there is a skin eruption.

The *Mouth* shows an intensely congested and desquamating mucous membrane, particularly marked inside the lips and round the fauces.

The *Stomach* may present patches of congestion in the first three sacs, but the fourth, at the pyloric end, shows deep claret-coloured hæmorrhagic patches with erosions.

The *Small Intestine* is intensely inflamed with patches of diphtheritic exudate, whilst the solitary glands and Peyer's patches are swollen and congested.

The *Large Intestine* has a congested, swollen mucous membrane, particularly in the cæcum, whilst the rectum has longitudinal lines of greyish adherent exudate on the red and congested mucous membrane (zebra markings).

The *Serous Membranes* show hæmorrhagic spots, and the venous blood is purplish.

The *Flesh* has a peculiar odour, and may be magenta- or mahogany-coloured.

The *other organs* have the ordinary changes associated with fever, but nothing characteristic of this disease.

Symptoms.—The animal is dull, off its feed, and has a staring coat. The temperature rises early in the disease. The breathing is quick. There is a mucous discharge from the eyes and nose, and the latter is frequently blood-stained. The milk-supply ceases in milch cows. The mucous membrane of the nostrils is reddened, and shows a diphtheritic deposit resembling bran. This deposit spreads, and may be found on the muzzle, lips, and inside the mouth and on the tongue. In the later stages there is a foul, blood-stained diarrhoea. Emaciation occurs rapidly, and death usually ensues in about a week.

Judgment.—Absolute destruction of the entire carcass is required by the Board of Agriculture legislation.

The Cattle Plague Order, 1895.—*Disposal of Carcases.*

Section 8.—1. The carcase of an animal which at the time of its death was affected with or suspected of cattle plague (other than an animal slaughtered by order of the Board under the Act of 1894) shall be disposed of by the local authority as follows :

(i.) Either the local authority shall cause the carcase to be buried as soon as possible in its skin in some proper place at a depth of not less than six feet below the surface of the earth, and to be covered with a sufficient quantity of quicklime or other disinfectant ;

(ii.) Or the local authority may, if authorized by licence of the Board, cause the carcase to be destroyed, under the inspection of the local authority, in the mode following: The carcase shall be disinfected, and shall then be taken, in charge of an officer of the local authority, to a horse-slaughterer's or knacker's yard approved for the purpose by the Board, or other place so approved, and shall be there destroyed by exposure to a high temperature or by chemical agents.

2. With the view to the execution of the foregoing provisions of this article, the local authority may make such regulations as they think fit for prohibiting or regulating the removal of carcases, or for securing the burial or destruction of the same.

3. Where under this article a local authority cause a carcase to be buried, they shall first cause the skin to be so slashed as to be useless.

4. A local authority may cause or allow a carcase to be taken into the district of another local authority to be buried or destroyed, with the previous consent of that local authority, but not otherwise.

Digging up.

Section 9.—It shall not be lawful for any person, except with the licence of the Board or permission in writing of an

inspector of the Board, to dig up, or cause to be dug up, the carcase of any animal that has been buried.

Foot and Mouth Disease.

Synonyms: Eczema epizootica; aphthous fever; contagious apthæ.

This is a specific disease, but the organism responsible has not yet been isolated. It is probably too small to be brought into view by our present powers of magnification. Foot and mouth disease is practically stamped out in Great Britain, but an occasional isolated outbreak occurs in the neighbourhood of some of our ports.

Animals affected.—Cattle are the only animals commonly attacked, but pigs, and less frequently sheep, are occasionally affected. The disease is transmissible to man by inoculation of the discharge from the lesions or by ingestion of milk or of butter obtained from animals with lesions of the udder. In man the lesions appear about the mouth, and the nails of the fingers and toes.

The **Period of Incubation** is about twenty-four to sixty hours. The virus is capable of living outside the animal body for three to ten weeks.

The method of infection is probably inoculation; eggs and straw from abroad have been held responsible for outbreaks in Great Britain. Except in very young animals, the disease is not usually fatal.

Symptoms.—There is usually some systemic disturbance and a raised temperature. If the feet are affected, the animal is usually lame, and when at rest is constantly stamping. The feet are swollen and tender just above the hoofs, and may show greyish-white vesicles the size of a two-shilling bit, which burst and leave ragged ulcers that usually suppurate. These lesions are commonly found at the heel, or in the cleft at the junction of the skin and hoof. When the mouth is affected, there is excessive salivation (saliva streaming from the mouth) and constant champing and smacking of the lips. Large vesicles occur under the lips and on the free portion of the tongue.

The *milk* becomes thick and yellowish-white, with a bad taste. It is usually diminished in quantity, and if there are lesions on the udder it may be infective.

Lesions.—The characteristic lesion is the vesicle.

Cattle.—1. The commonest site is the toothless border of the upper jaw, the tip and sides of the tongue, the mucous membrane of the cheeks, and the nasal septum. 2. Next in order of frequency is the junction of skin and hoof, and the cleft of the hoof. 3. Occasionally lesions are found on the udder, at the base of the horns, in the pharynx, and in the genital passages. Very occasionally one finds a gelatinous œdema of the gastric mucous membrane or hæmorrhagic enteritis.

Pigs.—The most common sites are the feet, in which usually all four toes are affected, and the tip of the snout.

The lesions of the feet, particularly in pigs, tend to bleed, and occasionally slough, the latter condition being probably the result of septic infection.

There are several conditions that may be mistaken for foot and mouth disease, and they are worthy of mention :

1. Foot-rot in sheep : The mouth is never affected, and usually only the soles of the feet.

2. Foul of foot in cattle (Low) : The lesion is always interdigital and suppurating, and the mouth is always free.

3. Actinomycosis of the tongue : The feet are unaffected.

4. Chemical or traumatic injuries to the feet.

Judgment.—The affected parts are dangerous, but the meat is innocuous. In this country, however, the flesh never reaches the market, as the Board of Agriculture requires slaughter and destruction of the carcasses of both the infected animals and those in contact.

The Foot and Mouth Disease Order, 1895.—

Disposal of Carcasses.

Section 7.—1. The carcase of an animal which has died of foot and mouth disease shall be disposed of by the local authority as follows :

(i.) Either the local authority shall cause the carcase to be buried as soon as possible in its skin in some proper place at a depth of not less than six feet below the surface of the earth, and to be covered with a sufficient quantity of quicklime or other disinfectant;

(ii.) Or the local authority may, if authorized by licence of the Board, cause the carcase to be destroyed, under the inspection of the local authority, in the mode following: The carcase shall be disinfected, and shall then be taken, in charge of an officer of the local authority, to a horse-slaughterer's or knacker's yard approved for the purpose by the Board, or other place so approved, and shall be there destroyed by exposure to a high temperature or by chemical agents.

2. With the view to the execution of the foregoing provisions of this article, the local authority may make such regulations as they think fit for prohibiting or regulating the removal of carcasses, or for securing the burial or destruction of the same.

3. Where under this article a local authority cause a carcase to be buried, they shall first cause the skin to be so slashed as to be useless.

4. A local authority may cause or allow a carcase to be taken into the district of another local authority to be buried or destroyed, with the previous consent of that local authority, but not otherwise.

Digging up.

Section 8.—It shall not be lawful for any person, except with a licence of the Board or permission in writing of an inspector of the Board, to dig up, or cause to be dug up, the carcase of any animal that has been buried.

Contagious Pleuro-Pneumonia of Cattle.

This is a contagious disease, peculiar to the ox, the causal agent of which has not yet been isolated. It was at one time very rife in Great Britain, but is now extinct. Actual

contact with the living diseased animal is necessary in order to infect a healthy one, and all attempts at inoculation have resulted in a local lesion only. Yet placing healthy cattle in contact with the lungs of animals dead of the disease fails to transmit it.

The Lesions.—There is always pneumonia, which may be uncomplicated, but if at all extensive it is usually accompanied by pleurisy. In any case the pleurisy is always secondary to the pneumonia.

Naked-Eye Appearance—*Lung.*—As much as half one lung may be in a state of hepatization. The affected part is very voluminous, firm, airless, solid to the touch, and sinks in water. It cuts with a smooth surface and well-defined edge. If still warm when incised, a clear, straw-coloured exudate escapes from the lung, mainly from the interlobular septa of the affected part. This exudate, if collected, forms a soft clot. The cut surface is compared in appearance with that of marble, the 'veins' of which represent the interlobular septa of the lung. These septa are yellowish-white and enormously thickened (they may be $\frac{1}{2}$ inch across), and are saturated with the same clear fluid. The lobular tissue of the lung appears like various coloured islands surrounded by these septa. The usual colours of these islands are a reddish muscle colour, a pale red or yellowish-red, a brick red, or a dark red like that of venous blood. If the affected area of the lung is large, its appearance will not be uniform throughout; and though the more recent areas will be as described above, the older parts will be firm and nearly dry, with little or no fluid escaping. Such areas are about to undergo necrosis, or may be so far advanced towards that condition as to be partially encapsuled and detached from the living lung.

Pleura.—If a large area of lung is affected, there is usually a sero-fibrinous pleurisy, with an adherent layer of cream-coloured lymph on the surface of the pleura, and a turbid liquid in the pleural sac; or the pleura may be adherent to the lung.

Flesh.—In the acute stages the flesh is ‘fevered’ and soapy, and does not set well. If there is much fluid in the chest, the flesh is often water-logged, particularly about the sternum and belly.

Judgment.—The disease is not likely to be encountered in Great Britain. If the flesh appears marketable, it is quite fit to eat, but the Board of Agriculture require that it shall be destroyed.

Pleuro-Pneumonia Order, 1895.—

Disposal of Carcases.

Section 7.—1. The carcase of a head of cattle which has died of pleuro-pneumonia shall be disposed of by the local authority as follows :

(i.) Either the local authority shall cause the carcase to be buried as soon as possible in its skin in some proper place at a depth of not less than six feet below the surface of the earth, and to be covered with a sufficient quantity of quicklime or other disinfectant ;

(ii.) Or the local authority may, if authorized by licence of the Board, cause the carcase to be destroyed, under the inspection of the local authority, in the mode following : The carcase shall be disinfected, and shall then be taken, in charge of an officer of the local authority, to a horse-slaughterer’s or knacker’s yard approved for the purpose by the Board, or other place so approved, and shall be there destroyed by exposure to a high temperature or by chemical agents.

2. With the view to the execution of the foregoing provisions of this article, the local authority may make such regulations as they think fit for prohibiting or regulating the removal of carcases, or for securing the burial or destruction of the same.

3. A local authority may cause or allow a carcase to be taken into the district of another local authority to be buried or destroyed, with the previous consent of that local authority, but not otherwise.

Digging up.

Section 8.—It shall not be lawful for any person, except with a licence of the Board or permission in writing of an inspector of the Board, to dig up, or cause to be dug up, the carcase of any head of cattle that has been buried.

Texas Fever.

This disease was first recognised in the United States, but is now known to occur in North America, Australia (tick fever), and Finland.

Animals affected.—Cattle are the only animals affected, but in this country the disease is rarely seen, and then only at the ports. Sheep are immune.

Etiology.—Texas fever is due to a small amœboid parasite which develops in the red corpuscles of the blood, and is known as the *Pyrosoma bigeminum*. This parasite has never been cultivated in artificial cultures, but in the blood it is found to exhibit two main forms, both of which stain with methylene blue. In one stage of its existence it is pear-shaped, and two such pear-shaped bodies are frequently found in one red corpuscle (hence the name *bigeminum*). This pear-shaped form is from $2\ \mu$ to $4\ \mu$ long by $1.5\ \mu$ to $2\ \mu$ where broadest, with a probable nucleus that stains somewhat more intensely. The second form is smaller and almost like a micrococcus. It is more common in the blood of animals suffering from a chronic form of the disease. The blood of diseased cattle is highly infectious to healthy ones, and the natural method of infection is inoculation by ticks.

Appearance of the Carcase.—Small hæmorrhages are found under the skin and in the internal organs, which are usually greatly congested. The spleen is enlarged to twice its normal size. The kidneys are congested, with brownish pigment granules in the tubules, and the bladder contains blood-stained urine. In the acute form the flesh is usually 'fevered.' In the chronic form the carcase is emaciated, watery, and anæmic, and there is no blood-stained urine.

Judgment.—No harm to man has ever been recorded through eating the flesh of cattle suffering from this disease. But the blood of the carcase is highly infectious to healthy cattle, and the carcase usually spoilt in appearance and unfit for the market, so that the entire carcase had better be seized and destroyed.

Rabies (Hydrophobia).

No organism has yet been demonstrated as responsible for this disease; but the virus maintains its existence by propagation in the body of dogs, and is transmitted to other dogs, and occasionally to man and other animals. No animal, indeed, appears to be immune.

The **Method of Infection** is almost invariably by inoculation through being bitten by a rabid dog, but the saliva of such a dog may infect any animal through a sore or abrasion. It is never transmitted by ingestion or inhalation. It is of little interest to meat inspectors in this country, as it is now exotic.

The **Period of Incubation** is about five or six weeks.

Symptoms in Cattle.—Infected cattle constantly rub the site of inoculation against posts, trees, etc., until frequently a large sore results. They are constantly yawning, have saliva dribbling from the mouth, and soon become wild and excited, breaking through fences, rushing about, and attacking other cattle. They usually die in less than a week, in a state of paralysis and emaciation.

Appearance of the Carcase.—There is nothing constant or characteristic in the appearance of the carcase. It is usually emaciated, and soon putrefies. The blood is thick and dark. The mucous membrane of the alimentary tract shows hæmorrhages, and is swollen and inflamed. The fauces are frequently œdematous, and foreign bodies are almost constantly found in the stomach. If there is a history of a dog-bite, followed by the above-described symptoms, and the presence of foreign bodies in the

stomach, rabies may be suspected ; but to make certain it is necessary to inoculate rabbits, intradurally, with the mashed medulla of the suspected animal.

Judgment.—The carcase must be condemned, although infection of man from such a carcase has never been recorded.

CHAPTER XI

Verbatim copy of Public Health Acts, Regulations, etc. : Public Health Act, 1875, sect. 116-119, 166-170—Public Health Acts (Amendment) Act, 1890, sect. 28-31—Public Health (London) Act, 1891, sect. 17, 18, 20, 36, 47, 71—Public Health (Regulations as to Food) Act, 1907—Public Health (Foreign Meat) Regulations, 1908—Sale of Horseflesh, etc., Regulation Act, 1889—Model Byelaws as to Slaughter-houses—Model Byelaws respecting Markets—Humane Slaughtering (L.G.B.)—Sale of Food and Drugs Acts, 1875, 1879, 1899—Metropolis Local Management Act, 1862, sect. 93, 94—Public Health (Scotland) Act, 1897, sect. 33, 34, 43—Borough Police Act, 1892, sect. 278-287—Public Health (Ireland) Act, 1878, sect. 103-106, 132-136—Anthrax Order, 1910—Swine Fever Orders.

PUBLIC HEALTH ACT, 1875.

UN SOUND MEAT, ETC.

116. Any medical officer of health or inspector of nuisances may at all reasonable times inspect and examine any animal, carcass, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk exposed for sale, or deposited in any place for the purpose of sale, or of preparation for sale, and intended for the food of man, the proof that the same was not exposed or deposited for any such purpose, or was not intended for the food of man, resting with the party charged ; and if any such animal, carcass, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk appears to such medical officer or inspector to be diseased, or unsound, or unwholesome, or unfit for the food of man, he may seize and carry away the same himself or by an assistant, in order to have the same dealt with by a justice.

117. If it appears to the justice that any animal, carcass, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk so seized is diseased, or unsound, or unwholesome, or unfit for the food of man, he shall condemn the same, and order it to be destroyed or so disposed of as to prevent it from being exposed for sale or used for the food of man ; and the person to whom the same belongs, or

did belong, at the time of exposure for sale, or in whose possession or on whose premises the same was found, shall be liable to a penalty not exceeding twenty pounds for every animal, carcass, or fish, or piece of meat, flesh, or fish, or any poultry or game, or for the parcel of fruit, vegetables, corn, bread, or flour, or for the milk so condemned, or, at the discretion of the justice, without the infliction of a fine, to imprisonment for a term of not more than three months.

The justice who under this section is empowered to convict the offender may be either the justice who may have ordered the article to be disposed of or destroyed, or any other justice having jurisdiction in the place.

118. Any person who in any manner prevents any medical officer of health or inspector of nuisances from entering any premises and inspecting any animal, carcass, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk exposed or deposited for the purpose of sale, or of preparation for sale, and intended for the food of man, or who obstructs or impedes any such medical officer, or inspector, or his assistant, when carrying into execution the provisions of this Act, shall be liable to a penalty not exceeding five pounds.

119. On complaint made on oath by a medical officer of health, or by an inspector of nuisances, or other officer of a local authority, any justice may grant a warrant to any such officer to enter any building or part of a building in which such officer has reason for believing that there is kept or concealed any animal, carcass, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk which is intended for sale for the food of man, and is diseased, unsound, or unwholesome, or unfit for the food of man; and to search for, seize and carry away any such animal or other article in order to have the same dealt with by a justice under the provisions of this Act.

Any person who obstructs any such officer in the performance of his duty under such warrant shall, in addition to any other punishment to which he may be subject, be liable to a penalty not exceeding twenty pounds.

MARKETS AND SLAUGHTER-HOUSES.

166. Where an urban authority are a local board or improvement commissioners, they shall have power, with the consent of the owners and ratepayers of their district, expressed by resolution passed in manner provided in Schedule III. to this Act, and where the urban authority are a town council they shall have power, with the consent of two-thirds of their number, to do the following things, or any of them, within their district:

To provide a market-place, and construct a market-house and other conveniences, for the purpose of holding markets;

To provide houses and places for weighing carts;

To make convenient approaches to such market ;

To provide all such matters and things as may be necessary for the convenient use of such market ;

To purchase, or take on lease, land and public or private rights in markets and tolls for any of the foregoing purposes ;

To take stallages, rents, and tolls in respect of the use by any person of such market ;

but no market shall be established in pursuance of this section so as to interfere with any rights, powers, or privileges enjoyed within the district by any person without his consent.

167. For the purpose of enabling any urban authority to establish or to regulate markets, there shall be incorporated with this Act the provisions of the Markets and Fairs Clauses Act, 1847, in so far as the same relate to markets—that is to say :

With respect to the holding of the market or fair, and the protection thereof ; and

With respect to the weighing goods and carts ; and

With respect to the stallages, rents, and tolls ;

provided that all tolls leviable by an urban authority in pursuance of this section shall be approved by the Local Government Board.

An urban authority may with respect to any market belonging to them make by-laws for any of the purposes mentioned in Section 42 of the Markets and Fairs Clauses Act, 1847, so far as those purposes relate to markets, and printed copies of any by-laws so made shall be conspicuously exhibited in the market.

168. Any urban authority may purchase, and the directors of any market company, in pursuance, in the case of a company registered under the Companies Act, 1862, of a special resolution of the members passed in manner provided by the Act, and in that case of any other company, of a resolution passed by a majority of three-fourths in number and value of the members present, either personally or by proxy, at a meeting specially convened with notice of the business to be transacted, may sell and transfer to any urban authority, on such terms as may be agreed on between the company and the urban authority, all the rights, powers, privileges, and all or any of the markets, premises, and things which at the time of such purchase are the property of the company, but subject to all liabilities attached to the same at the time of such purchase.

169. Any urban authority may, if they think fit, provide slaughter-houses, and they shall make by-laws with respect to the management and charges for the use of any slaughter-houses so provided.

For the purpose of enabling any urban authority to regulate slaughter-houses within their district, the provisions of the Towns Improvement Clauses Act, 1847, with respect to slaughter-houses shall be incorporated with this Act.

Nothing in this section shall prejudice or affect any rights, powers or privileges of any persons incorporated by any local Act passed, before the passing of the Public Health Act, 1848, for the purpose of making and maintaining slaughter-houses.

NOTICE TO BE AFFIXED ON SLAUGHTER-HOUSES.

170. The owner or occupier of any slaughter-house licensed or registered under this Act shall, within one month after the licensing or registration of the premises, affix, and shall keep undefaced and legible on some conspicuous place on the premises, a notice with the words 'Licensed Slaughter-house,' or 'Registered Slaughter-house,' as the case may be.

Any person who makes default in this respect, or who neglects or refuses to affix or renew such notice after requisition in writing from the urban authority, shall be liable to a penalty not exceeding five pounds for every such offence, and of ten shillings for every day during which such offence continues after conviction.

PUBLIC HEALTH ACTS AMENDMENT ACT, 1890
(ADOPTIVE) (ENGLAND AND WALES).

28. (1) Sections 116 to 119 of the Public Health Act, 1875 (relating to unsound meat), shall extend and apply to all articles intended for the food of man, sold, or exposed for sale, or deposited in any place for the purpose of sale, or of preparation for sale, within the district of any local authority.

(2) A justice may condemn any such article, and order it to be destroyed or disposed of, as mentioned in Section 116 of the Public Health Act, 1875, if satisfied, on complaint being made to him, that such article is diseased, unsound, unwholesome, or unfit for the food of man, although the same has not been seized as mentioned in Section 116 of the said Act.

29. Licences granted after the adoption of this part of this Act for the use and occupation of places as slaughter-houses shall be in force for such time or times only, not being less than twelve months, as the urban authority shall think fit to specify in such licences.

30. (1) Upon any change of occupation of any building within an urban sanitary district registered or licensed for use and used as a slaughter-house, the person thereupon becoming the occupier or joint occupier shall give notice in writing of the change of occupation to the inspector of nuisances.

(2) A person who fails or neglects to give such notice within one month after the change of occupation occurs shall be liable to a penalty not exceeding five pounds.

(3) Notice of this enactment shall be endorsed on all licences granted after the adoption of this part of this Act.

31. If the occupier of any building licensed as aforesaid to be used as a slaughter-house for the killing of animals intended as human food is convicted by a court of summary jurisdiction of selling, or exposing for sale, or for having in his possession, or on his premises, the carcass of any animal, or any piece of meat or flesh diseased, or unsound, or unwholesome, or unfit for the use of man as food, the court may revoke the licence.

PUBLIC HEALTH (LONDON) ACT, 1891.

Section 17.—(1) A person shall not—

- (a) Feed or keep any swine in any locality, premises, or place which is unfit for the keeping of swine, or in which the feeding or keeping of swine may create a nuisance or be injurious to health ; or
- (b) Permit any swine to stray or go about in any street or public place.

(2) If any person acts in contravention of this section, he shall be liable to a fine not exceeding forty shillings, and to forfeit the swine, and to a further fine not exceeding ten shillings for every day during which he continues such offence after notice from the sanitary authority to discontinue the same.

(3) Any swine found straying or going about in any street or public place may be seized and removed by any constable.

(4) Any premises within forty yards of any street or public place shall be deemed for the purposes of this section to be a place unfit for keeping swine.

Section 18.—Where it is proved to the satisfaction of a petty sessional court that any locality, premises, or place are or is unfit for the keeping of any animal, the court may, by summary order, prohibit the using thereof for that purpose for the future.

Section 20.—(1) A person carrying on the business of a slaughterer of cattle or horses, knacker, or dairyman, shall not use any premises in London (outside the City of London) as a slaughter-house, or knacker's yard, or a cow-house or place for the keeping of cows, without a licence from the county council, and if he does he shall for each offence be liable to a fine not exceeding five pounds, and the fact that cattle have been taken into unlicensed premises shall be *prima facie* evidence that an offence under this section has been committed.

(2) A licence under this section shall expire on such day in every year as the county council fix, and when a licence is first granted shall expire on the day so fixed which secondly occurs after the grant of the licence, and a fee not exceeding five shillings, to be carried to the county fund, may be charged for the licence.

(3) Not less than fourteen days before a licence for any premises is granted or renewed under this section notice of the intention to apply for it shall be served on the sanitary authority of the district in which the premises are situate, and that sanitary authority, if they think fit, may show cause against the grant or renewal of the licence.

(4) An objection shall not be entertained to the renewal of a licence under this section, unless seven days' previous notice of the objection has been served on the applicant, save that, on an objection being made of which notice has not been given, the county council may, if they think it just so to do, direct notice thereof to be served on the applicant, and adjourn the question of the renewal to a future day, and require the attendance of the applicant on that day, and then hear the case, and consider the objection, as if the said notice had been duly given.

(5) Where a committee of the county council determine to refuse, or to recommend the council to refuse, the renewal of any licence under this section, the county council shall, on written application made within seven days after such determination is made known to the applicant, hear the applicant against any such refusal.

(6) For the purposes of this section a licence shall be deemed to be renewed where a further licence is granted in immediate succession to a prior licence for the same premises.

(7) The sanitary authority shall have a right to enter any slaughter-house or knacker's yard at any hour by day or at any hour when business is in progress or is usually carried on therein, for the purpose of examining whether there is any contravention therein of this Act or of any by-law made thereunder.

(8) Nothing in this section shall extend to slaughter-houses erected before or after the commencement of this Act in the Metropolitan Cattle Market under the authority of the Metropolitan Market Act, 1851, or the Metropolitan Market Act, 1857.

Section 36.—(1) The sanitary authority, if they think fit, may employ a sufficient number of scavengers, or contract with any scavengers, whether a company or individuals, for collecting and removing the manure and other refuse-matter from any stables and cow-houses within their district, the occupiers of which signify their consent in writing to such removal; provided that—

- (a) Such consent shall not be withdrawn or revoked without one month's previous notice to the sanitary authority; and
- (b) No person shall be hereby relieved from any fine to which he may be subject for placing dung or manure upon any footways or carriageways, or for having any accumulation or deposit of manure or other refuse-matter so as to be a nuisance or injurious or dangerous to health.

(2) Notice may be given by a sanitary authority (by public announcement in the district or otherwise) requiring the periodical removal of manure or other refuse-matter from stables, cow-houses, or other premises; and, where any such notice has been given, if any person to whom the manure or other refuse-matter belongs fails to comply with the notice, he shall be liable without further notice to a fine not exceeding twenty shillings for each day during which such non-compliance continues.

Section 47.—(1) Any medical officer of health or sanitary inspector may at all reasonable times enter any premises and inspect and examine—

- (a) Any animal intended for the food of man which is exposed for sale, or deposited in any place for the purpose of sale, or of preparation for sale; and
- (b) Any article, whether solid or liquid, intended for the food of man, and sold or exposed for sale, or deposited in any place for the purpose of sale or of preparation for sale;

the proof that the same was not exposed or deposited for any such purpose, or was not intended for the food of man, resting with the person charged; and if any such animal or article appears to such medical officer or inspector to be diseased, or unsound, or unwholesome, or unfit for the food of man, he may seize and carry away the same himself or by an assistant, in order to have the same dealt with by a justice.

(2) If it appears to a justice that any animal or article which has been seized or is liable to be seized under this section is diseased, or unsound, or unwholesome, or unfit for the food of man, he shall condemn the same, and order it to be destroyed, or so disposed of as to prevent it from being exposed for sale or used for the food of man; and the person to whom the same belongs, or did belong at the time of sale or exposure for sale, or deposit for the purpose of sale or of preparation for sale, or in whose possession or on whose premises the same was found, shall be liable, on summary conviction, to a fine not exceeding fifty pounds for every animal or article, or if the article consists of fruit, vegetables, corn, bread, or flour, for every parcel thereof so condemned, or, at the discretion of the court, without the infliction of a fine, to imprisonment for a term of not more than six months, with or without hard labour.

(3) Where it is shown that any article liable to be seized under this section, and found in the possession of any person, was purchased by him from another person for the food of man, and when so purchased was in such a condition as to be liable to be seized and condemned under this section, the person who so sold the same shall be liable to the fine and imprisonment above mentioned, unless he proves that at

the time he sold the said article he did not know, and had no reason to believe, that it was in such condition.

(4) Where a person convicted of an offence under this section has been within twelve months previously convicted of an offence under this section, the court may, if it thinks fit, and finds that he knowingly and wilfully committed both such offences, order that a notice of the facts be affixed, in such form and manner, and for such period not exceeding twenty-one days, as the court may order, to any premises occupied by that person, and that the person do pay the costs of such affixing; and if any person obstructs the affixing of such notice, or removes, defaces, or conceals the notice while affixed during the said period, he shall for each offence be liable to a fine not exceeding five pounds.

(5) If the occupier of a licensed slaughter-house is convicted of an offence under this section, the court convicting him may cancel the licence for such slaughter-house.

(6) If any person obstructs an officer in the performance of his duty, under any warrant for entry into any premises granted by a justice in pursuance of this Act for the purposes of this section, he shall, if the court is satisfied that he obstructed with intent to prevent the discovery of an offence against this section, or has within twelve months previously been convicted of such obstruction, be liable to imprisonment for any term not exceeding one month in lieu of any fine authorized by this Act for such obstruction.

(7) A justice may act in adjudicating on an offender under this section, whether he has or has not acted in ordering the animal or article to be destroyed or disposed of.

(8) Where a person has in his possession any article which is unsound, or unwholesome, or unfit for the food of man, he may, by written notice to the sanitary authority, specifying such article, and containing a sufficient identification of it, request its removal, and the sanitary authority shall cause it to be removed as if it were trade refuse.

Section 71.—(1) If the medical officer of health of any district has evidence that any person in the district is suffering from a dangerous infectious disease attributable to milk supplied within the district from any dairy situate within or without the district, or that the consumption of milk from such dairy is likely to cause any such infectious disease to any person residing in the district, such medical officer shall, if authorized by an order of a justice having jurisdiction in the place where the dairy is situate, have power to inspect the dairy, and if accompanied by a veterinary inspector or some other properly qualified veterinary surgeon, to inspect the animals therein; and if, on such inspection, the medical officer of health is of opinion that any such infectious disease is caused from consumption of the milk supplied

therefrom, he shall report thereon to the sanitary authority, and his report shall be accompanied by any report furnished to him by the said veterinary inspector or veterinary surgeon, and the sanitary authority may thereupon serve on the dairyman notice to appear before them within such time, not less than twenty-four hours, as may be specified in the notice, to show cause why an order should not be made requiring him not to supply any milk therefrom within the district until the order has been withdrawn by the sanitary authority.

(2) The sanitary authority, if in their opinion he fails to show such cause, may make the said order, and shall forthwith serve notice of the facts on the county council of the county in which the dairy is situate, and on the Local Government Board, and, if the dairy is situate within the district of another sanitary authority, on such authority.

(3) The said order shall be forthwith withdrawn on the sanitary authority or their medical officer of health on their behalf being satisfied that the milk-supply has been changed, or that the cause of the infection has been removed.

(4) If any person refuses to permit the medical officer of health, on the production of a justice's order under this section, to inspect any dairy, or if so accompanied as aforesaid, to inspect the animals kept there, or, after any such order has been made, supplies any milk within the district in contravention of the order, or sells it for consumption therein, he shall, on the information of the sanitary authority, be liable to a fine not exceeding five pounds, and, if the offence continues, to a further fine not exceeding forty shillings for every day during which the offence continues.

(5) Provided that—

(a) Proceedings in respect of the offence shall be taken before a court having jurisdiction in the place where the dairy is situate; and

(b) A dairyman shall not be liable to an action for breach of contract if the breach be due to an order under this section.

(6) Proceedings may be taken under this section in respect of a dairy in the district of a local authority under the Public Health Acts, and the notice of the facts shall be served on the local authority as if they were a sanitary authority within the meaning of this Act.

(7) Nothing in or done under this section shall interfere with the operation or effect of the Contagious Diseases (Animals) Acts, 1878 to 1886, or this Act, or of any order, licence, or act of the Board of Agriculture or the Local Government Board thereunder, or of any order, by-law, regulation, licence, or act of a local authority made, granted, or done under any such order of the Board of Agriculture or

the Local Government Board, or exempt any dairy, building, or thing, or any person from the provisions of any general Act relating to dairies milk, or animals.

PUBLIC HEALTH (REGULATIONS AS TO FOOD) ACT, 1907.

(7 *Edw. VII.*, c. 32.)

An Act to enable regulations to be made for the prevention of danger arising to public health from the importation, preparation, storage, and distribution of articles of food (August 28, 1907).

BE it enacted by the King's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :

1. Power to make Regulations as to the Importation, Preparation, Storage, and Distribution of Articles of Food.—

(1) The power of making regulations under the Public Health Act, 1896, 59 and 60 Vict., c. 19, and the enactments mentioned in that Act, shall include the power of making regulations authorizing measures to be taken for the prevention of danger arising to public health from the importation, preparation, storage, and distribution of articles of food or drink (other than drugs or water) intended for sale for human consumption, and, without prejudice to the generality of the powers so conferred, the regulations may—

- (a) Provide for the examination and taking of samples of any such articles ;
- (b) Apply as respects any matters to be dealt with by the regulations, any provision in any Act of Parliament dealing with the like matters, with the necessary modifications and adaptations ;
- (c) Provide for the recovery of any charges authorized to be made by the regulations for the purposes of the regulations or any services performed thereunder.

(2) For the purposes of regulations made under this Act, articles commonly used for the food or drink of man shall be deemed to be intended for sale for human consumption unless the contrary is proved.

(3) In the application of this Act to Scotland, Part IV. of the Public Health (Scotland) Act, 1897 (60 and 61 Vict., c. 38), shall be substituted for the Public Health Act, 1896.

2. **Publication of Regulations.**—All regulations made under this Act shall be laid as soon as may be before Parliament, and the Rules Publication Act, 1893 (56 and 57 Vict., c. 66), shall apply to such regulations as if they were statutory rules within the meaning of

Section 1 of that Act, and that Act as so applied shall, notwithstanding anything in Subsection 5 of Section 1 thereof, extend to Scotland, with the substitution of a reference to the *Edinburgh Gazette* for the reference to the *London Gazette*.

3. Short Title.—This Act may be cited as the Public Health (Regulations as to Food) Act, 1907.

THE PUBLIC HEALTH (FOREIGN MEAT) REGULATIONS, 1908.¹

(DATED SEPTEMBER 12, 1908.)

To all Port Sanitary Authorities ;—

To all other Sanitary Authorities as herein defined ;—

To all Officers of Customs ;—

To all Medical Officers of Health of the Sanitary Authorities aforesaid ;—

To all Masters of Ships ;—

And to all others whom it may concern.

Whereas by Section 1 of the Public Health (Regulations as to Food) Act, 1907, it is enacted as follows :—

‘ (1) The power of making regulations under the Public Health Act, 1896, and the enactments mentioned in that Act, shall include the power of making regulations authorising measures to be taken for the prevention of danger arising to public health from the importation, preparation, storage, and distribution of articles of food or drink (other than drugs or water) intended for sale for human consumption, and, without prejudice to the generality of the powers so conferred, the regulations may—

(a) provide for the examination and taking of samples of any such articles ;

(b) apply, as respects any matters to be dealt with by the regulations, any provision in any Act of Parliament dealing with the like matters, with the necessary modifications and adaptations ;

(c) provide for the recovery of any charges authorised to be made by the regulations for the purposes of the regulations or any services performed thereunder ;

‘ (2) For the purposes of regulations made under this Act, articles commonly used for the food or drink of man shall be deemed to be intended for sale for human consumption unless the contrary is proved.

* * * * *

¹ See 38th annual report of L.G.B., 1908-09, pp. 148-188, obtainable from Wyman and Sons, Fetter Lane, London, E.C.

And whereas We, the Local Government Board, are empowered by Regulations made under the Public Health Act, 1896, and the enactments mentioned in that Act, to provide for the Regulations being enforced and executed by the Officers of Customs, as well as by other Authorities and Officers, and by subsection 2 (a) of Section 1 of the Public Health Act, 1896, it is provided that the Regulations shall be subject to the consent, so far as they apply to the Officers of Customs, of the Commissioners of His Majesty's Customs ;

And whereas, for the prevention of danger arising to public health, it is expedient that such Regulations as are hereinafter set forth be made in relation to articles of food ;

And whereas the Commissioners of His Majesty's Customs have signified their consent to the said Regulations, so far as they apply to the Officers of Customs :

Now therefore, We, the Local Government Board, by this Our Order, and in the exercise of the powers conferred upon Us by the Public Health Act, 1875, the Public Health (London) Act, 1891, the Public Health Act, 1896, and the Public Health (Regulations as to Food) Act, 1907, and of every other power enabling Us in that behalf, do make the following Regulations, that is to say :—

Article I.—In these Regulations, unless the contrary intention appears—

- (a) Words importing the masculine gender include females ;
- (b) Words in the singular include the plural, and words in the plural include the singular ;
- (c) Expressions referring to writing include references to printing and other modes of representing or reproducing words in a visible form ;
- (d) The expression 'cattle' includes a bull, cow, ox, heifer, calf, ram, ewe, wether, goat, and kid ;
- (e) The expression 'pig' includes a boar, sow, and hog ;
- (f) The expression 'meat' means pork, the flesh of cattle, any other edible part of a pig or of cattle, or a substance, compound, material, or article of which pork, or the flesh of cattle, or any other edible part of a pig or of cattle is an ingredient ;
- (g) The expression 'foreign' used in relation to meat means brought from a place situate elsewhere than in the United Kingdom, the Channel Islands, or the Isle of Man ;
- (h) The expression 'Official Certificate' used in relation to foreign meat or in relation to a box, case, receptacle, or package containing foreign meat, means a certificate, label, mark, stamp, or other voucher which, by a notice published in the London Gazette at time during the period of twelve months beginning on the First day of October, One thousand nine hundred and eight, or which,

on and after the expiration of that period, by any further Regulations under the Public Health (Regulations as to Food) Act, 1907, is declared to be admissible during the said period, or after the expiration of the said period, in the manner, to the extent, and subject to the rules and conditions, prescribed in that notice, or in those Regulations, as evidence that the cattle or pig from which the meat is derived has been certified by a competent authority in the place of origin to be free from disease at the time of slaughter, and that the meat has been certified by the like authority to have been dressed or prepared, and packed with the needful observance of all requirements for the prevention of danger arising to public health from the meat as an article of food ;

(2) The expression ' Foreign Meat of Class I.' means foreign meat in the form

(A) Of scrap meat, namely, meat which, whether it is fresh, or has, before importation, been subjected to a process of freezing or other refrigeration, or to chemical or other treatment, with or without the addition of any preservative or colouring substance—

(i.) consists of scraps, trimmings, or other pieces of such shape or in such condition as to afford insufficient means of identification with definite parts of a carcase ;

(ii.) has not, before importation, been made ready for human consumption in the form of a sausage, or of another prepared or manufactured article of food ; and

(iii.) is without bone in its natural state of attachment ;

or

(B) Of tripe, namely, any edible part of the stomach, or

Of a tongue, or kidney,

to which formalin, or a solution, or other preparation of, or comprising formic aldehyde ; or a compound containing fluorine or boron ; or salicylic acid, formic acid, sulphurous acid, benzoic acid, or any compound of any such acid has been applied ;

or

(C) Of severed parts of the carcase of a pig, or of other edible parts of a pig, which have not, before importation, been salted, cured, pickled, dried, or smoked, or otherwise prepared as bacon or ham, and which are not contained in a box, case, receptacle, or package with an official certificate impressed thereon, or affixed or attached thereto ;

(7) The expression ' Foreign Meat of Class II.' means foreign meat which, being in the form of the entire carcase of a pig, has not, before importation, been salted, cured, pickled, dried, or smoked, or otherwise prepared as bacon or ham, and is without the head in its natural state of attachment to the carcase, and is without the

- lymphatic glands about the throat and any other part of the carcase in their natural position ;
- (k) The expression ' Foreign Meat of Class III. ' means foreign meat which is in the form of severed parts of the carcase of a pig, or of other edible parts of a pig, which has not before importation been salted, cured, pickled, dried, or smoked, or otherwise prepared as bacon or ham, which is not and does not comprise any foreign meat of Class I., and which is contained in a box, case, receptacle, or package with an official Certificate impressed thereon, or affixed or attached thereto ;
 - (l) The expression ' Foreign Meat Unclassed ' means foreign meat other than foreign meat of Class I., foreign meat of Class II., or foreign meat of Class III. ;
 - (m) The expression ' importer ' means any person in the United Kingdom who, either as owner or consignee, agent or broker, is entitled to the possession, custody, or control of any foreign meat ;
 - (n) The expression ' ship ' includes a vessel or boat ;
 - (o) The expression ' Officer of Customs ' includes any person acting under the authority of the Commissioners of His Majesty's Customs ;
 - (p) The expression ' Master ' used in relation to a ship includes the officer, or other person for the time being in charge or command of the ship ;
 - (q) The expression ' Sanitary Authority ' means every Port Sanitary Authority, and every Council of a Municipal Borough or other Urban District, and every Rural District Council whose borough or district includes or abuts on any part of a Customs port which part is not within the jurisdiction of a Port Sanitary Authority ;
 - (r) The expression ' the District ' means the District of a Sanitary Authority ;
 - (s) The expression ' Medical Officer of Health ' includes any duly qualified Medical Practitioner appointed or employed by a Sanitary Authority to act in the execution of these Regulations ; and any other person appointed or employed by the Sanitary Authority under these Regulations to exercise any powers, or to discharge any duties assigned to the Medical Officer of Health ;
 - (t) The expression ' Local Authority ' means every Council of a Municipal Borough or other Urban District and every Rural District Council, not being a Sanitary Authority within the meaning of these Regulations, and includes the Common Council of the City of London and every Council of a Metropolitan Borough ;
 - (u) The expression ' area ' used in relation to a Local Authority means the area subject to the jurisdiction of the Local Authority for the purposes of the Public Health Act, 1875, or of the Public Health (London) Act, 1891, as the case may be.

Article II.—These Regulations shall come into operation on the First day of January, One thousand nine hundred and nine, and shall then and thereafter apply and have effect in relation to the District of every Sanitary Authority throughout England and Wales, and shall be enforced and executed by every Officer of Customs, by every Sanitary Authority, and by the Medical Officer of Health, and where the circumstances so require, by any other Officer of a Sanitary Authority.

Article III.—(1) The Officer of Customs, on the arrival of a ship within the District, shall ascertain whether the cargo of the ship comprises any foreign meat.

(2) Where the Officer of Customs finds, or has reason to believe, that the cargo comprises foreign meat having, according to the best opinion which, in the circumstances of the case, his knowledge enables him to form, the characteristics of Foreign Meat of Class I., or of Foreign Meat of Class II., the Officer of Customs by a notice in writing given to the Master or to the importer shall require that, until the meat has been examined by the Medical Officer of Health, it shall not be removed from the ship, or from the place of delivery or of landing, or from any other place which the Officer of Customs specifies in the notice.

The Officer of Customs shall at the same time inform the Medical Officer of Health to the effect of the notice.

(3) Where the Officer of Customs finds that the cargo comprises Foreign Meat of Class III., or Foreign Meat Unclassed, the Officer of Customs, unless, by reason of facts brought to his knowledge, or of representations made to him, he is of opinion that the meat requires examination by the Medical Officer of Health, may allow the meat to be removed from the ship, or from the place of delivery or of landing, without any such examination.

Where the Officer of Customs is of opinion that the meat requires examination by the Medical Officer of Health, the Officer of Customs by a notice in writing shall require that, until the meat has been examined by the Medical Officer of Health, it shall not be removed from the ship, or from the place of delivery or of landing, or from any other place which the Officer of Customs specifies in the notice.

The Officer of Customs shall at the same time inform the Medical Officer of Health to the effect of the notice.

(4) When any notice has been given in relation to any foreign meat by the Officer of Customs, in pursuance of subdivision (2) or of subdivision (3) of this Article, a person shall not, without the express permission of the Officer of Customs, remove the meat, at any time before its examination by the Medical Officer of Health, from the ship, or from the place of delivery or of landing, or from any other place specified in the notice.

(5) On being informed by the Officer of Customs to the effect of the

notice given by him in pursuance of subdivision (2) or of subdivision (3) of this Article, the Medical Officer of Health shall forthwith proceed to examine the foreign meat to which the notice relates.

If, upon his examination of the meat, the Medical Officer of Health is of opinion that the meat may be removed to a place of destination in England or Wales for any purpose other than exportation, he shall give a certificate in writing to that effect.

If, upon his examination of the meat, the Medical Officer of Health is of opinion that the meat should not be removed to a place of destination in England or Wales for any purpose other than exportation, he shall by a notice in writing forbid the removal of the meat for any purpose other than exportation.

(6) Every notice given by the Officer of Customs, and every certificate and every notice given by the Medical Officer of Health in pursuance of this Article, shall set forth the description of the foreign meat to which the notice or certificate relates, and such other details as will suffice to identify the particular consignment.

The Medical Officer of Health shall give every such certificate in duplicate, and every such notice in triplicate.

The Medical Officer of Health shall give one copy of the certificate to the Officer of Customs, and one copy to the importer.

The Medical Officer of Health shall give one copy of the notice to the Officer of Customs, one copy to the importer, and one copy to the Sanitary Authority.

Article IV.—(1) Where the Medical Officer of Health has ascertained that any foreign meat which the Officer of Customs has allowed to be removed, is still within the District, the Medical Officer of Health may proceed forthwith to examine the meat.

If, upon his examination of the meat, the Medical Officer of Health is of opinion that the meat should not be removed to a place of destination in England or Wales for any purpose other than exportation, he shall by a notice in writing forbid the removal of the meat for any purpose other than exportation.

(2) Every notice given by the Medical Officer of Health in pursuance of this Article shall set forth the description of the foreign meat to which the notice relates, and such other details as will suffice to identify the particular consignment.

The Medical Officer of Health shall give every such notice in duplicate.

The Medical Officer of Health shall give one copy of the notice to the importer, and one copy to the Sanitary Authority.

Article V.—The Medical Officer of Health in determining whether, in the case of any foreign meat to which these Regulations apply, he shall give a certificate or a notice in pursuance of these Regulations, shall observe and comply with the following rules, that is to say :—

He shall not give a certificate and shall give a notice as regards Foreign Meat of Class I. and Foreign Meat of Class II. :

He shall not give a certificate and shall give a notice as regards Foreign Meat of Class III., or Foreign Meat Unclassed, if, in his opinion, the meat, notwithstanding the official certificate, is diseased, unsound, unwholesome, or unfit for human consumption.

Article VI.—The Sanitary Authority, within twelve hours after the receipt of a copy of a notice by the Medical Officer of Health, in pursuance of subdivision (5) of Article III., or of subdivision (1) of Article IV., with respect to any foreign meat, shall give to the importer notice in writing which, in addition to such other particulars (if any) as the Sanitary Authority deem necessary or expedient, shall state that, unless, within twelve hours after the receipt of the notice, the importer gives to the Sanitary Authority a written undertaking to the effect that, subject to compliance in all respects with the requirements of any Regulations made under the Public Health (Regulations as to Food) Act, 1907, and in force for the time being, he will export the meat at his own expense, or, in proceedings before a Justice in pursuance of those Regulations, he will prove that the meat is not intended or sale for human consumption, the Sanitary Authority will cause the meat to be destroyed under the supervision of the Medical Officer of Health.

Article VII.—(1) Where, in pursuance of Article VI., a notice has been given by the Sanitary Authority with respect to any foreign meat, and no such written undertaking as is described in the notice has been received by the Sanitary Authority within the time specified in the notice, the Sanitary Authority shall forthwith cause the meat to which the notice relates to be destroyed, under the supervision of the Medical Officer of Health.

(2) Where, in pursuance of Article VI., a notice has been given by the Sanitary Authority with respect to any foreign meat, and within the time specified in the notice the Sanitary Authority have received such a written undertaking as is described in the notice to the effect that the importer will at his own expense export the meat, and within three days after the receipt by the Sanitary Authority of the undertaking the importer fails to export the meat, the Sanitary Authority shall cause the meat to be destroyed under the supervision of the Medical Officer of Health.

Article VIII.—(1) Where, in pursuance of Article VI., a notice has been given by the Sanitary Authority with respect to any foreign meat, and within the time specified in the notice, the Sanitary Authority have received such a written undertaking as is described in the notice to the effect that, subject to compliance in all respects with any Regulations

made under the Public Health (Regulations as to Food) Act, 1907, and in force for the time being, the importer, in proceedings before a Justice, in pursuance of those Regulations, will prove that the meat if not intended for sale for human consumption, the Sanitary Authority shall within twenty-four hours after the receipt of the written undertaking take such steps as are prescribed or authorised by this Article to obtain the decision of a Justice with respect to the subject-matter of the undertaking of the importer or to any subject-matter of this Article.

(2) For the purposes of this Article, an application may be made by the Sanitary Authority to any Justice having jurisdiction in the District, and thereupon subsection (2) of section twenty-eight of the Public Health Acts Amendment Act, 1890, whether that subsection is or is not in force in the District, and any provision in any Act of Parliament which applies to a proceeding under or consequent upon that subsection, shall have effect in relation to the proceedings, as if the application were a complaint within the meaning of the said subsection, and otherwise subject to such modifications and adaptations as are necessary to give effect to the following provisions, that is to say:—

- (i.) An order made by a Justice under the said subsection, as applied by this subdivision, shall direct any foreign meat to be destroyed by the Sanitary Authority under the supervision of the Medical Officer of Health, if the Justice is satisfied that, in pursuance of any Regulations made under the Public Health (Regulations as to Food) Act, 1907, and in force for the time being, the removal of the meat to a place of destination in England or Wales for any purpose other than exportation has been forbidden, and that, on the evidence adduced before him, there is an absence of proof that the meat is not intended for sale for human consumption.

Where the Justice is satisfied, on the evidence adduced before him, that it has been proved that the meat is not intended for sale for human consumption, he shall make an order of dismissal of the application. By that order the Justice shall direct that the prohibition of the removal of the meat in pursuance of any such Regulation as aforesaid shall cease to have effect.

- (ii.) The Justice shall further set forth in the order the description of and such other details as will suffice to identify the particular consignment of meat; together with the name, description, and abode of the importer, and the name, description, and abode of the person to whom the consignment of meat is to be delivered; and shall forthwith furnish the Sanitary Authority with a copy of the order.

Article IX.—Where a notice forbidding the removal of any foreign meat has been given by the Medical Officer of Health in pursuance of

subdivision (5) of Article III., or of subdivision (1) of Article IV., and a Justice has not, in pursuance of subdivision (2) of Article VIII., directed that the prohibition of the removal of the meat shall cease to have effect, a person shall not at any time remove the meat to a place of destination in England or Wales for any purpose other than exportation.

Article X.—Where the Sanitary Authority in pursuance of these Regulations cause any foreign meat to be destroyed, the Sanitary Authority, before the destruction of the meat, shall cause the description of, and such other details as will suffice to identify the particular consignment to be duly recorded, shall give to the importer a notice in writing of the destruction of the meat, including the contents of the record, and shall keep the record in their custody for a period of not less than twelve months.

Article XI.—A certificate or notice which, in pursuance of these Regulations, the Medical Officer of Health is empowered or required, or the Sanitary Authority are required to give, may be given by properly addressing, prepaying, and posting a letter containing the certificate or notice.

Article XII.—The Medical Officer of Health may, for any purpose of these Regulations, take a sample of foreign meat on board a ship, or delivered overside or landed within the District, and shall dispose of the sample in such manner as the Sanitary Authority direct.

Article XIII.—A Master of a ship or another person shall not knowingly land or put on shore within the District of a Sanitary Authority, any foreign meat which, in compliance with a requisition of a Sanitary Authority in pursuance of these Regulations, the importer has caused to be exported.

Article XIV.—A person, in relation to anything within his knowledge, shall answer truly all such questions put to him by, and give all such information to the Officer of Customs or the Medical Officer of Health as are necessary for any purpose of these Regulations; and a person in relation to anything within his knowledge, and material to any purpose of proceedings in pursuance of these Regulations, shall make a true statement, and truly answer any question when required or put by a Justice or other competent authority in the course and for any purpose of those proceedings.

Article XV.—(1) The Sanitary Authority may, with Our Consent, appoint and pay a legally qualified Medical Practitioner to act in the execution of these Regulations, either in the place of, or as an Assistant to the Medical Officer of Health.

(2) The Sanitary Authority may also, with Our Consent, appoint or employ and pay a person to act, under the direction of the Medical Officer of Health, in the exercise of any such powers or in the discharge of any such duties of the Medical Officer of Health under

these Regulations as the Sanitary Authority assign to the person so appointed.

Article XVI.—A Sanitary Authority and a Local Authority, or two or more Sanitary Authorities or Local Authorities, shall act together for the purposes of these Regulations in every case in which We, by Order, require any such joint action.

In every such case, these Regulations shall, in relation to each Sanitary Authority, to each District of a Sanitary Authority, to each Local Authority, and to each area of a Local Authority to whom and to which the Order applies, have effect subject to such adaptations and modifications as are made by the Order.

Article XVII.—(1) If a difference arises in relation to any subject-matter of, or to anything done under these Regulations, the difference may, on the application of all the parties affected, be referred to Us for determination.

(2) It shall be at Our option to determine any such difference as arbitrators or otherwise; and, if We elect to determine the difference as arbitrators, the provisions of the Regulation of Railways Act, 1868, respecting arbitrations by the Board of Trade, and the enactments amending those provisions, shall apply as if they were re-enacted in these Regulations, and in terms made applicable to Us, and to the determination of the difference.

(3) Where We elect to determine any such difference otherwise than as arbitrators, We may by Our Order determine the difference, and Our determination shall be final and conclusive.

(4) Every Order made by Us in pursuance of this Article shall have effect as if the Order were enacted in these Regulations.

Article XVIII.—These Regulations may be cited as ‘The Public Health (Foreign Meat) Regulations, 1908.’

SALE OF HORSEFLESH, ETC., REGULATION ACT, 1889.

AN ACT TO REGULATE THE SALE OF HORSEFLESH FOR HUMAN FOOD.

(24TH JUNE, 1889.)

WHEREAS it is desirable to make regulations with respect to the sale of horseflesh for human food:

Be it therefore enacted by the Queen’s most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

Signs on Horseflesh Shops.

1. No person shall sell, offer, expose, or keep for sale any horseflesh for human food, elsewhere than in a shop, stall, or place over or upon

which there shall be at all times painted, posted, or placed in legible characters of not less than four inches in length, and in a conspicuous position, and so as to be visible throughout the whole time, whether by night or day, during which such horseflesh is being offered or exposed for sale, words indicating that horseflesh is sold there.

Horseflesh not to be sold as Other Meat.

2. No person shall supply horseflesh for human food to any purchaser who has asked to be supplied with some meat other than horseflesh, or with some compound article of food which is not ordinarily made of horseflesh.

Power of Medical Officer of Health to inspect Meat, etc.

3. Any medical officer of health or inspector of nuisances or other officer of a local authority acting on the instructions of such authority or appointed by such authority for the purposes of this Act may at all reasonable times inspect and examine any meat which he has reason to believe to be horseflesh, exposed for sale or deposited for the purpose of sale, or of preparation for sale, and intended for human food, in any place other than such shop, stall, or place as aforesaid, and if such meat appears to him to be horseflesh he may seize and carry away or cause to be seized and carried away the same, in order to have the same dealt with by a justice as hereinafter provided.

Power of Justice to grant Warrant for Search.

4. On complaint made on oath by a medical officer of health or inspector of nuisances, or other officer of a local authority, any justice may grant a warrant to any such officer to enter any building, or part of a building other than such shop, stall, or place as aforesaid, in which such officer has reason for believing that there is kept or concealed any horseflesh which is intended for sale, or for preparation for sale for human food, contrary to the provisions of this Act; and to search for, seize, and carry away or cause to be seized and carried away any meat that appears to such officer to be such horseflesh, in order to have the same dealt with by a justice as herein-after provided.

Any person who shall obstruct any such officer in the performance of his duty under this Act shall be deemed to have committed an offence under this Act.

Power of Justice with Reference to Disposal of Horseflesh.

5. If it appears to any justice that any meat seized under the foregoing provisions of this Act is such horseflesh as aforesaid, he may make such order with regard to the disposal thereof as he may think desirable; and the person in whose possession or on whose premises the meat was found shall be deemed to have committed an offence

under this Act, unless he proves that such meat was not intended for human food contrary to the provisions of this Act.

Penalty.

6. Any person offending against any of the provisions of this Act, for every such offence shall be liable to a penalty not exceeding twenty pounds, to be recovered in a summary manner ; and if any horseflesh is proved to have been exposed for sale to the public in any shop, stall, or eating-house other than such shop, stall, or place as in the first section mentioned, without anything to show that it was not intended for sale for human food, the onus of proving that it was not so intended shall rest upon the person exposing it for sale.

Definition of 'Horseflesh.'

7. For the purposes of this Act 'horseflesh' shall include the flesh of asses and mules, and shall mean horseflesh, cooked or uncooked, alone or accompanied by or mixed with any other substance.

Local Authorities for Purposes of Act.

8. For the purposes of this Act the local authorities shall be, in the City of London and the liberties thereof, the Commissioners of Sewers, and in the other parts of the county of London the vestries and district boards acting in the execution of the Metropolis Local Management Acts, and in other parts of England the urban and rural sanitary authorities, and in Ireland the urban and rural sanitary authorities under the Public Health (Ireland) Act, 1878 [41 & 42 Vict. c. 52].

Application to Scotland.

9. In the application of this Act to Scotland the expression 'justice' shall include sheriff and sheriff substitute, and the expression 'local authority' shall mean any local authority authorised to appoint a public analyst under the Sale of Food and Drugs Act, 1875 [38 & 39 Vict. c. 63], and the procedure for the enforcement of this Act shall be in the manner provided in the thirty-third section of the said Sale of Food and Drugs Act, 1875.

Short Title.

10. This Act may be cited as the Sale of Horseflesh, etc., Regulation Act, 1889.

Commencement of Act.

11. This Act shall come into operation on the twenty-ninth day of September one thousand eight hundred and eighty-nine.

BYELAWS WITH RESPECT TO SLAUGHTER-HOUSES.

MEMORANDUM.

Section 169 of the Public Health Act, 1875 (38 & 39 Vict. c. 55), enacts that 'for the purpose of enabling any Urban Authority to regulate slaughter-houses within their district, the provisions of the Towns Improvement Clauses Act, 1847 [10 & 11 Vict. c. 34], with respect to slaughter-houses, shall be incorporated with this Act.'

Of the incorporated provisions of the Towns Improvement Clauses Act, 1847, sec. 128 is in the following terms.

'The Commissioners [Urban Authority] shall, from time to time, by byelaws . . . make regulations for the licensing, registering, and inspection of the . . . slaughter-houses . . . and preventing cruelty therein, and for keeping the same in a cleanly and proper state, and for removing filth at least once in every twenty-four hours, and requiring them to be provided with a sufficient supply of water; and they may impose pecuniary penalties on persons breaking such byelaws; provided that no such penalty exceed for any one offence the sum of five pounds, and in the case of a continuing nuisance the sum of ten shillings for every day during which such nuisance shall be continued after the conviction for the first offence.'

By the next section (129), it is provided that 'the justices before whom any person is convicted of killing or dressing any cattle contrary to the provisions of this or the special Act [*i.e.*, the Public Health Act, 1875], or of the non-observance of any of the byelaws or regulations made by virtue of this or the special Act, in addition to the penalty imposed on such person under the authority of this or the special Act, may suspend, for any period not exceeding two months, the licence granted to such person under this or the special Act, or in case such person be the owner or proprietor of any registered slaughter-house . . . may forbid, for any period not exceeding two months, the slaughtering of cattle therein; and such justices, upon the conviction of any person for a second or other subsequent like offence, may, in addition to the penalty imposed under the authority of this or the special Act, declare the licence granted under this or the special Act, revoked, or if such person be the owner or proprietor of any registered slaughter-house, may forbid absolutely the slaughtering of cattle therein; and whenever the licence of any such person is revoked as aforesaid, or whenever the slaughtering of cattle in any registered slaughter-house . . . is absolutely forbidden as aforesaid, the Commissioners may refuse to grant any licence whatever to the person whose licence has been so revoked, or on account of whose default the

slaughtering of cattle in any registered slaughter-house has been forbidden.'

Further by section 130 of the Towns Improvement Clauses Act, 1847, it is enacted that 'every person who during the period for which any such licence is suspended, or after the same is revoked as aforesaid, slaughters cattle in the slaughter-house . . . to which such licence relates, or otherwise uses such slaughter-house . . . or allows the same to be used as a slaughter-house . . . , and every person who during the period that the slaughtering of cattle in any such registered slaughter-house . . . is forbidden as aforesaid, or after such slaughtering has been absolutely forbidden therein, slaughters any cattle in any such registered slaughter-house, shall be liable to a penalty not exceeding five pounds for such offence, and a further penalty of five pounds for every day on which any such offence is committed after the conviction for the first offence.'

In connection with these provisions, and those relating to the licensing and registration of slaughter-houses, in sections 125-127, the attention of the Urban Authority should be directed to the judgment of the Court of Exchequer Chamber in the case of *Anthony v. The Brecon Markets Company* (26 L.T., n.s., 982).

With reference to that judgment, a few observations may here be introduced in illustration of the nature and extent of the powers of the Urban Authority with regard to slaughter-houses.

It will be seen that the provisions of the Towns Improvement Clauses Act, 1847, incorporated with the Public Health Act, 1875, by section 169 of the latter Act, recognize two classes of slaughter-houses, viz., slaughter-houses in use and occupation at the time of the passing of the 'special Act,' and slaughter-houses not in use and occupation at that time. To the former class the requirements as to registration in section 127 are specially applicable. To the latter class the provisions as to licensing in sections 125 and 126 have direct reference.

Both classes may apparently be regulated by byelaws under section 128.

In framing a model series of byelaws under that enactment, the Board have considered that the statutory terms do not warrant the extension of the scope of the byelaws to regulations directly affecting the structure of the premises.

But as regards premises for which under section 126 the licence of the Urban Authority will be required, the Board have been advised that, in the exercise of the discretionary power of licensing which has been conferred upon the Urban Authority, the following rules as to site and structure should influence their decision upon each application for a licence :

1. The premises to be erected or to be used and occupied as a slaughter-house should not be within 100 feet of any dwelling-house ;

and the site should be such as to admit of free ventilation by direct communication with the external air on two sides at least of the slaughter-house.

2. Lairs for cattle in connexion with the slaughter-house should not be within 100 feet of a dwelling-house.

3. The slaughter-house should not in any part be below the surface of the adjoining ground.

4. The approach to the slaughter-house should not be on an incline of more than one in four, and should not be through any dwelling-house or shop.

5. No room or loft should be constructed over the slaughter-house.

6. The slaughter-house should be provided with an adequate tank or other proper receptacle for water, so placed that the bottom shall not be less than six feet above the level of the floor of the slaughter-house.

7. The slaughter-house should be provided with means of thorough ventilation.

8. The slaughter-house should be well paved with asphalt or concrete, and laid with proper slope and channel towards a gully, which should be properly trapped and covered with a grating, the bars of which should not be more than three-eighths of an inch apart.

Provision for the effectual drainage of the slaughter-house should also be made.

9. The surface of the walls in the interior of the slaughter-house should be covered with hard, smooth, impervious material, to a sufficient height.

10. No watercloset, privy, or cesspool should be constructed within the slaughter-house.

There should be no direct communication between the slaughter-house and any stable, watercloset, privy, or cesspool.

11. Every lair for cattle in connexion with the slaughter-house should be properly paved, drained, and ventilated.

12. No habitable room should be constructed over any lair.

It remains to call attention to two provisions contained in the Public Health Acts Amendment Act, 1890 (53 & 54 Vict. c. 59), which apply in cases where Part III. of that Act has been adopted by an Urban Authority :—

(a) Under section 29 the Urban Authority may limit the duration of licences granted, after the adoption of Part III., for the use and occupation of places as slaughter-houses so that such licences 'shall be in force for such time or times only, not being less than twelve months, as the Urban Authority shall think fit to specify in such licences.' Certain forms which are prescribed by the model clauses will be found to give effect to this provision.

(b) Where a licence for the use and occupation of a slaughter-house is granted, after the adoption of Part III., the provisions of section 30

of that Act are required by subsection (3) of that section to be endorsed on the licence. This enactment prescribes that upon any change of occupation of any building within an Urban District registered or licensed for use and used as a slaughter-house, the person thereupon becoming the occupier or joint occupier shall give notice in writing of the change of occupation to the inspector of nuisances. A person failing or neglecting to give the notice becomes liable to a penalty. (Section 30 (2).)

REVISE OF 1909.

In preparing a new edition of this series of byelaws, the Board, in view of the recommendations of the Committee appointed by the Admiralty to consider the Humane Slaughtering of Animals, have added three new clauses, Nos. 9, 11, and 12, for preventing cruelty in slaughter-houses.

Clause 9 is inserted with a view to carry out the recommendation of the Committee, that 'all animals, without exception, must be stunned, or otherwise rendered unconscious, before blood is drawn.'

While, however, the Board concur in the principle of this recommendation, it must be remembered that attempts at stunning, carelessly or unskillfully made, may be the means of inflicting, instead of avoiding, unnecessary pain, and hence the Board suggest that, before making a byelaw requiring the stunning of any animal other than horned cattle, the local authority should ascertain how far the butchers in the district are prepared to carry out the practice. In relation to this question the Board have been advised by the Board of Agriculture and Fisheries that they would see no objection to a byelaw requiring the stunning of pigs or calves, but that the stunning of sheep is a difficult operation, in the carrying out of which cruelty might easily occur. On the other hand the Committee satisfied themselves that sheep can be stunned expeditiously and without difficulty, by striking them on the top of the head between the ears—not on the forehead—with a small club having a heavy head; and they state that in Denmark, many parts of Germany, and Switzerland, the law requires that sheep shall always be stunned previous to being stuck. But while the practice of stunning sheep may be a proper one to adopt in public abattoirs, where it will be carried out by skilled slaughter-men, the Board doubt whether it is advisable to require its adoption in private establishments unless there is reasonable ground for believing that it will be properly performed.

The Board have also thought it right, in view of representations which have been made to them by the Jewish authorities to add a proviso permitting slaughtering by the Jewish method, under proper conditions. This method is described in a report by the late Sir

Michael Foster, F.R.S., and Professor Starling, F.R.S., appended to the Report of the Admiralty Committee (Appendix J.). The liability to the infliction of unnecessary suffering appears to occur especially in the preliminary throwing of the bullock and extension of the neck. The duration of consciousness to pain after the actual cutting of the throat, if skilfully performed, was estimated by Sir M. Foster as in different instances from something less than 5 seconds to something less than 40 seconds.

Clauses 11 and 12 are inserted with a view to carry out the recommendation of the Admiralty Committee, that animals awaiting slaughter should be spared as far as possible from any contact with the sights or smells of the slaughter-house. The Committee say, 'as an animal cannot speak it is impossible to accurately determine to what extent it does or does not suffer from fear, but there is no doubt that cattle especially frequently show great reluctance to entering the slaughter chamber and can only be dragged in by the employment of considerable force.' The presumption is, that what they chiefly object to is the smell of blood; but whether this can be proved or not the Committee recommend that the animals should be given the full benefit of the doubt.

NOTE.—Any local Authority proposing to make byelaws on this subject should apply to the Local Government Board for a form on which to submit a draft of the byelaws for the Board's preliminary approval.

BYELAWS made by the¹

with respect to SLAUGHTER-HOUSES in the²

Interpretation.

1. Throughout these byelaws the expression 'the Council' means the¹

For the licensing, registering, and inspection of slaughter-houses, for preventing cruelty therein, for keeping the same in a cleanly and proper state, for removing filth at least once in every twenty-four hours, and requiring such slaughter-houses to be provided with a sufficient supply of water.

¹ 'Mayor, Aldermen, and Burgesses of the Borough of _____, acting by the Council'; or 'Urban [or Rural] District Council of _____', as the case may be.
² Insert 'Borough of _____'; or Urban [or Rural] District of _____; or, if the byelaws are to apply to part only of a rural district, 'that portion of the Rural District of _____ which comprises the contributory places of _____'; as the case may be.

2. Every person who shall apply to the Council for a licence for the erection of any premises to be used and occupied as a slaughter-house shall furnish in the form hereunto appended a true statement of the particulars therein required to be specified.

FORM OF APPLICATION

FOR

A LICENCE

To erect premises for use and occupation as a Slaughter-house.

To the¹

I, _____, of _____, do hereby apply to you for a licence, in pursuance of the statutory provisions in that behalf, for the erection of certain premises to be used and occupied as a slaughter-house [²subject to the condition that a licence, which shall be in force for a period of _____, be granted by you in respect of such use and occupation]; and I do hereby declare that to the best of my knowledge and belief the Schedule hereunto annexed contains a true statement of the several particulars therein set forth with respect to the said premises.

SCHEDULE.

- | | |
|--|--|
| <p>1. Boundaries, area, and description of the proposed site of the premises to be erected for use and occupation as a slaughter-house.</p> | |
| <p>2. Description of the premises to be erected on such site:</p> <p>(a) Nature, position, form, superficial area and cubical contents of the several buildings therein comprised.</p> <p>(b) Extent of paved area in such buildings, and materials to be employed in the paving of such area.</p> <p>(c) Mode of construction of the internal surface of the walls of such buildings, and materials</p> | |

¹ 'Town Council of the Borough of _____'; or 'Urban [or Rural] District Council of _____'; as the case may be.

² Where Section 29 of the Public Health Acts Amendment Act, 1890, is not in force, omit the words in brackets.

SCHEDULE—continued.

to be employed in such construction.

(d) Means of water supply,—position, form, materials, mode of construction and capacity of the several cisterns, tanks, or other receptacles for water to be constructed for permanent use in or upon the premises.

(e) Means of drainage,—position, size, materials, and mode of construction of the several drains.

(f) Means of lighting and ventilation.

(g) Means of access for cattle from the nearest street or public thoroughfare.

(h) Number, position, and dimensions of the several pounds, stalls, pens, or lairs to be provided on the premises.

(i) Number of animals for which accommodation will be provided in such pounds, stalls, pens, or lairs, distinguishing—

1. Oxen.
2. Calves.
3. Sheep and lambs.
4. Swine.

Witness my hand this

day of

19 .

(Signature of Applicant.)

(Address of Applicant.)

3. Every person who shall apply to the Council for a licence for the use and occupation of any premises as a slaughter-house shall furnish, in the form hereunto appended, a true statement of the particulars therein required to be specified.

FORM OF APPLICATION

FOR

A LICENCE

*For the use and occupation of premises as a Slaughter-house.*To the¹

I, _____, of _____, do hereby apply to you for a licence, in pursuance of the statutory provisions in that behalf, for the use and occupation as a slaughter-house of the premises herein-after described [for a period of _____ from the date of such licence]; and I do hereby declare that to the best of my knowledge and belief the Schedule hereunto annexed contains a true statement of the several particulars therein set forth with respect to the said premises.

SCHEDULE.

1. Situation and boundaries of the premises to be used and occupied as a slaughter-house.

2. Christian name, surname, and address of the owner of the premises.

3. Nature and conditions of applicant's tenure of the premises.
 (a) For what term; and whether by lease or otherwise.
 (b) Whether applicant is sole owner, lessee, or tenant; or whether applicant is jointly interested with any other person or persons, and if so, with whom.

4. Description of the premises:
 (a) Nature, position, form, superficial area, and cubical contents of the several buildings therein comprised.

¹ 'Town Council of the Borough of _____'; or 'Urban [or Rural] District Council of _____'; as the case may be.

² Where Section 29 of the Public Health Acts Amendment Act, 1890, is not in force, omit the words in brackets.

SCHEDULE—*continued.*

(b) Extent of paved area in such buildings, and materials employed in the paving of such area.

(c) Mode of construction of the internal surface of the walls of such buildings and materials employed in such construction.

(d) Means of water supply,—position, form, materials, mode of construction and capacity of the several cisterns, tanks, or other receptacles for water, constructed for permanent use in or upon the premises.

(e) Means of drainage,—position, size, materials, and mode of construction of the several drains.

(f) Means of lighting and ventilation.

(g) Means of access for cattle from the nearest street or public thoroughfare.

(h) Number, position, and dimensions of the several pounds, stalls, pens, or lairs provided on the premises.

(i) Number of animals for which accommodation will be provided in such pounds, stalls, pens, or lairs, distinguishing—

1. Oxen.
2. Calves.
3. Sheep and lambs.
4. Swine.

Witness my hand this

day of

19 .

(Signature of Applicant.)

(Address of Applicant.)

4. Every person to whom the Council may have resolved that a licence be granted to erect premises for use and occupation as a slaughter-house shall be entitled to receive from the Council a licence in the form hereunto appended, or to the like effect.

FORM OF LICENCE

*To erect premises for use and occupation as a
Slaughter-house.*

No. of }
Licence } _____

Reference to }
Folio in Register } _____

Borough [or Urban (or Rural) District] of _____

Whereas application has been made to us, the¹
_____, by _____, of _____,
for a licence to erect on a site within the said Borough [or District]
certain premises for use and occupation as a slaughter-house:

Now, we, the said Council, in pursuance of the powers conferred
upon us by the statutory provisions in that behalf, do hereby license
the said _____, of _____, to erect upon
the site defined or described in the Schedule hereunto annexed the
premises whereof the description is set forth in the said Schedule,
and which may be used and occupied as a slaughter-house [²subject
to the

condition that a licence, which shall be in force for a period of
_____, be granted by us, in respect of such use and occupation].

SCHEDULE.

Boundaries, area, and description of the proposed site of the premises to be erected for use and occupation as a slaughter-house.	Description of the premises to be erected for use and occupation as a slaughter-house.

Given under the Common Seal of the



this _____ day of _____, in the
year One thousand nine hundred and _____

Town Clerk (or Clerk to the Council).

¹ 'Town Council of the Borough of _____'; or 'Urban [or Rural]
District Council of _____'; as the case may be.

² Where Section 29 of the Public Health Acts Amendment Act, 1890, is not
in force, omit the words in brackets.

5. Every person to whom the Council may have resolved that a licence be granted for the use and occupation of any premises as a slaughter-house shall be entitled to receive from the Council a licence in the form hereunto appended, or to the like effect.

FORM OF LICENCE

For the use and occupation of premises as a Slaughter-house.

No. of }
Licence } _____

Reference to }
Folio in Register } _____

Borough [or Urban (or Rural) District] of

Whereas application has been made to us, the¹

, by , of
for a licence for the use and occupation of certain premises as a slaughter-house:

Now, we, the said Council, in pursuance of the powers conferred upon us by the statutory provisions in that behalf, do hereby license the said , of
to use and occupy as a slaughter-house the premises whereof the situation and description are set forth in the Schedule hereunto annexed [²for a period of from the date hereof].

SCHEDULE.

Situation of the premises to be used and occupied as a slaughter-house.	Description of the premises to be used and occupied as a slaughter-house.

Given under the Common Seal of the

(L.S.)

this day of , in the
year One thousand nine hundred and

Town Clerk (or Clerk to the Council).

¹ 'Town Council of the Borough of ' ; or 'Urban [or Rural] District Council of ' ; as the case may be.

² Where Section 29 of the Public Health Acts Amendment Act, 1890, is not in force, omit the words in brackets.

6. Every person who may have obtained from the Council, in accordance with the provisions of the byelaw in that behalf, a licence to erect any premises for use and occupation as a slaughter-house, or a licence for the use and occupation of any premises as a slaughter-house, shall register such premises at the office of the Council.

He shall, for such purpose, apply, by notice in writing addressed to the clerk to the Council, to register such premises; and thereupon it shall be the duty of the clerk to the Council, within a reasonable time after the receipt of such notice in writing, to enter in a book to be provided by the Council in the form hereunto appended the particulars therein required to be specified.

FORM OF REGISTER OF SLAUGHTER-HOUSES.

Borough [*or* Urban (*or* Rural) District] of

Folio

Date of registration.	Particulars of licence.					Christian name, surname, and address of owner of slaughter-house.	Christian name, surname, and address of occupier of slaughter-house.	Situation of slaughter-house.	Number of animals for which accommodation is provided on the premises.			
	For erection of slaughter-house.		For use and occupation of slaughter-house.						Oxen.	Calves.	Sheep and lambs.	Swine.
	No. of licence.	Date of licence.	No. of licence.	Date of licence.	Period of duration of licence.							
1	2	3	4	5	6	7	8	9	10	11	12	13

* Where Section 29 of the Public Health Acts Amendment Act, 1890, is not in force, omit column 6.

7. Every occupier of a slaughter-house shall, at all reasonable times, afford free access to every part of the premises to the Medical Officer of Health, the Inspector of Nuisances, or the Surveyor of the Council, or to any Committee specially appointed by the Council in that behalf, for the purpose of inspecting such premises.

8. Every occupier of a slaughter-house shall cause every animal brought to such slaughter-house for the purpose of being slaughtered, and confined in any pound, stall, pen, or lair upon the premises previously to being slaughtered, to be provided during such confinement with a sufficient quantity of wholesome water.

9. A person shall not, in a slaughter-house, proceed to slaughter any bull, ox, cow, heifer, calf, or pig, until the same shall have been effectually stunned.

Provided that this requirement shall not be deemed to apply to any member of the Jewish faith, duly licensed by the Chief Rabbi as a Slaughterer, when engaged in the slaughtering of cattle intended for the food of Jews according to the Jewish method of slaughtering, if no unnecessary suffering is inflicted.

10. Every occupier of a slaughter-house and every servant of such occupier and every other person employed upon the premises in the slaughtering of cattle shall, before proceeding to slaughter any bull, ox, cow, heifer, or steer, cause the head of such animal to be securely fastened so as to enable such animal to be felled with as little pain or suffering as practicable, and shall in the process of slaughtering any animal use such instruments and appliances and adopt such method of slaughtering and otherwise take such precautions as may be requisite to secure the infliction of as little pain or suffering as practicable.

11. A person shall not, in a slaughter-house, slaughter, or cause or suffer to be slaughtered, any animal in the view of another animal.

12. An occupier of a slaughter-house shall not cause or allow any blood or other refuse to flow from such slaughter-house so as to be within the sight or smell of any animal in the slaughter-house, and he shall not cause or allow any such blood or other refuse to be deposited in the waiting pens or lairs.

13. Every occupier of a slaughter-house shall cause the means of ventilation provided in or in connexion with such slaughter-house to be kept at all times in proper order and efficient action; and so that the ventilation shall be by direct communication with the external air.

14. Every occupier of a slaughter-house shall cause the drainage provided in or in connexion with such slaughter-house to be kept at all times in proper order and efficient action.

15. Every occupier of a slaughter-house shall cause every part of the internal surface of the walls and every part of the floor or pavement of such slaughter-house to be kept at all times in good order and repair, so as to prevent the absorption therein of any blood or liquid refuse or filth which may be spilled or splashed thereon, or any offensive or noxious matter which may be deposited thereon or brought into contact therewith.

He shall cause every part of the internal surface above the floor or pavement of such slaughter-house to be thoroughly washed with hot

lime-wash at least four times in every year ; that is to say, at least once during the periods between the *first* and *tenth* of *March*, the *first* and *tenth* of *June*, the *first* and *tenth* of *September*, and the *first* and *tenth* of *December* respectively.

He shall cause every part of the floor or pavement of such slaughter-house, and every part of the internal surface of every wall on which any blood or liquid refuse or filth may have been spilled or splashed, or with which any offensive or noxious matter may have been brought into contact during the process of slaughtering or dressing in such slaughter-house, to be thoroughly washed and cleansed within *three hours* after the completion of such slaughtering or dressing,

16. An occupier of a slaughter-house shall not at any time keep any dog, or cause or suffer any dog to be kept in such slaughter-house.

He shall not at any time keep, or cause or suffer to be kept in such slaughter-house any animal of which the flesh may be used for the food of man, unless such animal be so kept in preparation for the slaughtering thereof upon the premises.

He shall not at any time keep any cattle, or cause or suffer any cattle to be kept in such slaughter-house for a longer period than may be necessary for the purpose of preparing such cattle for the process of slaughtering.

If, at any time, he keep, or suffer to be kept in such slaughter-house any cattle for the purpose of preparation for the process of slaughtering, he shall not cause or suffer such cattle to be confined elsewhere than in the pounds, stalls, pens, or lairs provided on the premises.

17. Every occupier of a slaughter-house shall cause the hide or skin, fat, and offal of every animal slaughtered on the premises to be removed therefrom within *twenty-four hours* after the completion of the slaughtering of such animal.

18. Every occupier of a slaughter-house shall cause the means of water supply provided in or in connexion with such slaughter-house to be kept, at all times, in proper order and efficient action, and shall provide for use on the premises a sufficient supply of water for the purpose of thoroughly washing and cleansing the floor or pavement, every part of the internal surface of every wall of such slaughter-house, and every vessel or receptacle which may be used for the collection and removal from such slaughter-house of any blood, manure, garbage, filth, or other refuse products of the slaughtering of any cattle or the dressing of any carcase on the premises.

19. Every occupier of a slaughter-house shall provide a sufficient number of vessels or receptacles, properly constructed of galvanized iron or other non-absorbent material, and furnished with closely fitting covers, for the purpose of receiving and conveying from such slaughter-house all blood, manure, garbage, filth, or other refuse products of the

MODEL BYELAWS RESPECTING MARKETS.*Interpretation of terms.*

1. Throughout these byelaws the expression 'the Council' means the

For regulating the use of the market place and the buildings, stalls, pens, and standings therein, and for preventing nuisances or obstructions therein, or in the immediate approaches thereto.

2. A person resorting to the market place for the sale of any cattle, goods, provisions, marketable commodities or articles shall not, for the purpose of sale or of exposure for sale, place or cause to be placed such cattle, goods, provisions, marketable commodities or articles in any part or parts of the market place other than such as shall have been appropriated for the reception, deposit, or exposure for sale of the same, and shall be defined or described in a notice printed, painted, or marked in legible letters of such a colour as to be clearly distinguishable from the colour of the ground whereon such letters are printed, painted, or marked, and affixed or set up and continued in some suitable and conspicuous position at or near to such part or parts.

3. A person resorting to the market place for the sale of any cattle, goods, provisions, marketable commodities or articles shall not, for the purpose of sale or of exposure for sale, bring the same or cause the same to be brought into such market place before the hour of in the forenoon of any day appointed for the holding of any market.

4. A person resorting to the market place for the sale of any goods, provisions, marketable commodities or articles shall not allow such goods, provisions, marketable commodities or articles, or any part thereof, to remain in the market place after the hour of in the afternoon of any day appointed for the holding of any market.

5. Every tenant or occupier, or servant of a tenant or occupier of any building, stall, or standing in the market place shall, before the hour of in the afternoon of every day during which such building, stall, or standing may have been used for the sale or exposure for sale of any goods, provisions, marketable commodities or articles extinguish or cause to be extinguished every fire or light in, upon, or in connexion with such building, stall, or standing.

6. A tenant or occupier, or a servant of a tenant or occupier of any building, stall, or standing in the market place used for the sale, or exposure or preparation for sale of any carcase or meat intended for the food of man, shall not cleave such carcase or meat elsewhere than upon a cleaving block, or chopping board, or otherwise than when properly attached to or suspended from the hooks provided for the purpose in, upon, or in connexion with such building, stall, or standing.

7. A person who shall use any pen for the reception of any cattle brought into the market place for the purpose of sale, or of exposure for sale, shall not place or allow to be placed in such pen a greater number of cattle than shall be compatible with the allowance in respect of the several animals placed in such pen of an extent of superficial space¹ to be determined in accordance with the following regulations :

	<i>ft.</i>	<i>in.</i>	<i>ft.</i>	<i>in.</i>
For every horse :—				
a space not less than	„	by	„	
For every ox or cow :—				
a space not less than	„	by	„	
For every mule or ass :—				
a space not less than	„	by	„	
For every calf :—				
a space not less than	„	by	„	
For every ram, ewe, wether, lamb, goat, kid, or pig :—				
a space not less than	„	by	„	

8. A tenant or occupier of any building, stall, or standing in the market place shall not cause or allow any goods, provisions, marketable commodities or articles to be deposited or exposed for sale in or upon such building, stall, or standing, so that such goods, provisions, marketable commodities or articles, or any part thereof, shall project beyond the line of such building or stall, or beyond the limits assigned to such standing, so as to obstruct the passage of any person or vehicle or of any cattle, goods, provisions, marketable commodities or articles in or through the market place or any part thereof.

9. A tenant or occupier of any building, stall, or standing in the market place, or a person resorting to such market place for the sale of any goods, provisions, marketable commodities or articles, shall not for any longer time or in any other manner than shall be reasonably necessary for the conveyance of such goods, provisions, marketable commodities or articles, to or from such building, stall, or standing, or any part of such market place, deposit, or cause or allow to be deposited in any avenue or passage adjoining such building, stall, or standing, or elsewhere in such market place, or in any of the immediate approaches thereto, any hamper, crate, basket, box, barrel, or other receptacle for any goods brought into such market place for the purpose of sale or of exposure for sale.

10. Every tenant or occupier of any building, stall, or standing in the market place, shall cause such building, stall, or standing to be

¹ The following requirements have been suggested as generally suitable :—

For every horse, 8 feet by 2 feet. For every ox or cow, 8 feet by 2 feet.

For every mule or ass, 5 feet by 15 inches. For every calf, 5 feet by 15 inches.

For every sheep, goat, or pig (of medium size), 4 feet (superficial).

properly cleansed immediately before the reception, deposit, or exposure for sale therein or thereon and immediately after the removal therefrom of any goods, provisions, marketable commodities or articles.

11. Every tenant or occupier of any building, stall, or standing in the market place shall, from time to time, as often as occasion may require, during any day on which such building, stall, or standing may be used for the reception, deposit or exposure for sale therein or thereon of any goods, provisions, marketable commodities or articles, cause all filth, garbage, and refuse which may be produced or may accumulate in the course of the trade or business carried on by such tenant or occupier to be placed in such receptacle (if any) as may be provided by the Council, or otherwise in a receptacle of suitable construction and of adequate dimensions to be provided by such tenant or occupier, in, upon, or in close connexion with such building, stall, or standing.

He shall, from time to time, as often as may be necessary, cause the contents of such receptacle to be promptly removed, in such a manner and with such precautions as not to create a nuisance in the process of removal, to such place of deposit as shall, from time to time, be appointed by the Council, and shall be defined or described in a notice printed, painted, or marked in legible letters of such a colour as to be clearly distinguishable from the colour of the ground whereon such letters are printed, painted, or marked, and affixed or set up and continued in some suitable and conspicuous position at or near to such place of deposit.

12. A person resorting to the market place and being in charge of any waggon, cart, truck, barrow, or other vehicle or of any beast of burden shall not cause or allow such vehicle or beast to stand in any avenue or passage in such market place, or in any of the immediate approaches thereto, for any longer time than shall be reasonably necessary for the loading or unloading of any goods, provisions, marketable commodities or articles.

13. Every person resorting to the market place for the sale of any goods, provisions, marketable commodities, or articles, or in charge of any waggon, cart, truck, barrow, or other vehicle, or of any beast of burden used for the conveyance of any goods, provisions, marketable commodities or articles to or from such market place shall, from time to time as often as occasion may require, and in such a manner as to prevent nuisance or obstruction, remove or cause to be removed from every avenue or passage in such market place, or from the footway or roadway of any of the immediate approaches thereto, all vegetable or animal refuse, filth, litter, or rubbish which may have fallen or may have been thrown or deposited therein or thereon during the loading or unloading or the conveyance to or from such market place of such goods, provisions, marketable commodities or articles.

14. Every tenant or occupier of any building, stall, or standing in

the market place shall cause every avenue or passage in connexion with such building, stall, or standing, whether used by him alone or in conjunction with any other person, to be properly swept and cleansed once at least during each day appointed for the holding of any market.

15. A person resorting to the market place for the sale of any cattle, goods, provisions, marketable commodities or articles, shall not cause or allow such cattle, goods, provisions, marketable commodities or articles to be brought or conveyed to or from such market place, or any building, stall, or standing there, or to stand, be placed, or exposed for sale in such a manner as to obstruct the passage of any person or vehicle, or of any other cattle, goods, provisions, marketable commodities or articles in or through such market place or any part thereof or any of the immediate approaches thereto.

For fixing the days and the hours during each day on which the market shall be held.

16. A market¹
shall be held on² in every³
throughout the year⁴

On every day appointed for the holding of a market, such market shall be held between the hours of in the forenoon and
in the afternoon :

Provided that when any day herein-before appointed for the holding of a market shall be a day duly appointed for a solemn fast, or public thanksgiving, such market shall be held on the lawful day next following such first-mentioned day.

For regulating the carriers resorting to the market, and fixing the rates for carrying articles carried therefrom within the limits of the district.

17. A carrier resorting to the market place shall not, at any time, while plying for hire and not actually hired, occupy a station in any part or parts of the market place other than such as shall be appropriated as a stand or stands for carriers and shall be defined or described in a notice printed, painted, or marked in legible letters of such a colour as to be clearly distinguishable from the colour of the ground whereon such letters are printed, painted, or marked, and affixed, or set up, and continued in some suitable and conspicuous position at or near to the part or parts so appropriated.

¹ Here specify the class or description of wares for which the market is intended.

² Here insert the day of the week.

³ Here insert 'week,' 'fortnight,' 'month,' 'quarter,' as the case may require.

⁴ If the markets are not held periodically throughout the year, substitute the names of the months during which they are held.

18. A carrier resorting to the market place shall not, while plying for hire, canvass for hire by calling out or otherwise to the annoyance of any person.

19. Every carrier resorting to the market place shall at all times, while plying for hire, conduct himself with civility and propriety towards every person hiring or seeking to hire such carrier, and shall comply with every reasonable requirement of any person hiring such carrier.

20. Every carrier resorting to the market place shall be entitled to demand and receive from every person hiring such carrier a sum to be determined in accordance with the following table as the rate or charge for the carriage of any goods, provisions, marketable commodities or articles, from such market place to any place or places within the limits of the district :

Table of rates for the carriage of goods, provisions, marketable commodities, or articles from the market place.

Distance.	Weight.	Rate.
		<i>s. d.</i>
To any place within the distance of from the limits of the market place.	For a weight not exceeding lbs.	"
	For every additional lbs.	"
To any place beyond the distance of and within the distance of from the limits of the market place.	For a weight not exceeding lbs.	"
	For every additional lbs.	"
For every additional of distance beyond such last-mentioned distance.	For a weight not exceeding lbs.	"
	For every additional lbs.	"

Penalties.

21. Every person who shall offend against any of the foregoing byelaws shall be liable for every such offence to a penalty of :

Provided nevertheless, that the justices or court before whom any complaint may be made or any proceedings may be taken in respect of any such offence may, if they think fit, adjudge the payment, as a penalty, of any sum less than the full amount of the penalty imposed by this byelaw.

**RECOMMENDATIONS OF THE COMMITTEE APPOINTED
TO CONSIDER THE HUMANE SLAUGHTERING OF
ANIMALS.**

(Cd. 2150, 1908.)

GENERAL RECOMMENDATIONS.

6.¹ As a result of the foregoing inquiries and investigations, the Committee are of opinion that the methods of slaughter existing in this country are capable of considerable improvement, and they have come to the following general conclusions :

(a) All animals, without exception, should be stunned, or otherwise rendered unconscious, before blood is drawn.

This is actually the law in Denmark, many parts of Germany, and Switzerland, and therefore cannot be considered an impracticable condition. It has the great merit of comprehensiveness and simplicity, and, if carried out, makes the subsequent operations of slaughter of comparative unimportance from the standpoint of humanity. The detailed methods proposed to carry out this primary condition in the case of the various animals will be referred to subsequently. (*See para. 10.*)

(b) In the interests not only of humanity, but of sanitation, order, and ultimate economy, it is highly desirable that, where circumstances permit, private slaughter-houses should be replaced by public abattoirs, and that no killing should be permitted except in the latter, under official supervision. Such a change as this could only be brought about gradually and by legislation, but it cannot be described as impracticable, in view of the fact that this system is prescribed by law in several Continental countries and is actually enforced in the city of Edinburgh.

(c) There should be an efficient system of inspection and supervision of all slaughter-houses, whether public or private, by the local authority, and uniformity in methods of slaughter should be introduced and enforced as far as possible.

(d) All slaughtermen, and others employed in or about slaughter-houses, should be licensed by the local authority. The Committee have carefully considered the question as to whether the licence should partake of the nature of a certificate of proficiency, but they recommend that, for the present at any rate, it should be merely permissive (like the present licence for motor drivers), having as its main value the power of withdrawal in case of cruelty, incompetence, or misconduct. Only a nominal fee should be charged for a licence. The Committee have received a good deal of evidence to show that the institution of

¹ Paragraphs 1—5 inclusive have been omitted as they are merely an introduction giving the object of the inquiry, and the witnesses called during the inquiry.—AUTHOR.

licences would not only be desirable from a general standpoint, but would also be received with favour by the trade.

DESIGN OF SLAUGHTER-HOUSES.

7. The Committee are of opinion that many of the slaughter-houses in this country are unsatisfactory in design, and present features which are objectionable from a humanitarian standpoint.

It appears to be the common practice, even in modern and well-regulated slaughter-houses, to keep the animals which are immediately awaiting slaughter in pens which are mere annexes to the slaughter-chamber itself, and in many cases in full view of all that goes on inside. Moreover, the drainage of the slaughter-chamber is often so arranged that any blood which is not caught and saved, together with other refuse, flows out of the slaughter-chamber into or through the waiting-pens, under the noses of the animals awaiting slaughter. The Committee have witnessed this in slaughter-houses of the largest kind.

8. The Committee have given careful consideration to the question of the best design for a slaughter-house, and make the following general recommendations:

(a) The animals awaiting slaughter should be spared as far as possible from any contact with the sights or smells of the slaughter-house itself.

There is no point which the Committee have more carefully investigated than the question as to whether animals do or do not suffer fear from this contact, and the evidence of those best qualified to judge is so conflicting that no absolute verdict can be given. As an animal cannot speak it is impossible to accurately determine to what extent it does or does not suffer from fear, but there is no doubt that cattle, especially, frequently show great reluctance to entering the slaughter-chamber, and can only be dragged in by the employment of considerable force. The presumption is that what they chiefly object to is the smell of blood, but whether this can be proved or not, it is obviously undesirable from a purely business standpoint to run any risk, as it appears to be an established fact that the flesh of an animal, killed whilst in a state of fear or excitement, loses some of its palatable and marketable qualities.

Apart from this, the question is of such vital importance from the standpoint of humanity that it seems clear that the animal should be given the full benefit of the doubt.

(b) With this object in view, the waiting-pens should be separated from the slaughter-chamber, and the latter should be shut off by sliding doors. It is also of great importance that the pitch of the floor, and the drainage of the slaughter-chamber, should be away from, and not run into, the waiting-pens, as is often the case at present. The common practice of depositing blood barrels, freshly

removed hides, or refuse from the slaughter-house in close proximity to the waiting-pens should also be prohibited.

(c) It is important that the floor of the slaughter-chamber, whilst necessarily impervious, should not be slippery.¹ The smooth concrete floors existing in most slaughter-houses become very greasy when wet, and as a result cattle, especially if restive, are very apt to fall down and injure themselves before they can be secured in the proper position for slaughter.

(d) Cattle should, when possible, be slaughtered screened off from their fellows.

This can be arranged in moderate sized abattoirs by dividing up the side of the slaughter-chamber, opposite to the entrance doors, into stalls somewhat similar to those in a stable, but considerably wider. For quiet home-grown cattle a width of ten feet is sufficient, but where wilder cattle have to be killed a wider space is probably desirable. It is important that these stalls should be so arranged as not to screen the operations of slaughter from the view of the inspecting officials.

(e) Immediately after the carcasses have been bled, they should be moved on to, and 'dressed' in an adjoining room, screened off from the view of animals entering the slaughter-chamber.

This is easily accomplished by hitching a rope (from the winch if necessary) round the head or forelegs of the carcase, and by dragging it along the floor for the short distance (15 feet or so) into the 'dressing' room. The slaughter-stall should then at once be flushed down with the hose, so as to remove all traces of blood.

This method leaves the slaughter-spaces clear for the next batch of animals, whereas under the existing system there is either a loss of time through the slaughter-spaces being blocked up with the dressing operations, or else the next batch of animals on being brought into the slaughter-chamber are confronted with mutilated and disembowelled carcasses.

This latter circumstance, which is quite usual in existing slaughter-houses, is obviously objectionable from a humanitarian standpoint.

9. A model slaughter-house embodying the above provisions, and many others conducive to rapidity and economy of working, is now being constructed by the Admiralty at Chatham Dockyard.

DETAILED METHODS OF SLAUGHTER.

10. As a result of their investigations, and proceeding on the preliminary assumption that all animals should be stunned, or other-

¹ The selection of a pavement which affords a good foothold when wet or greasy, and which is both sanitary and impervious, presents some difficulties. In many foreign abattoirs slabs of roughened granite are used. This makes an admirable but expensive pavement. At the new Admiralty slaughter-house at Chatham a specially designed blue brick with a grooved and roughened surface is being tried.

wise rendered unconscious, before being bled, the Committee are of opinion that the following methods are the most humane, expeditious, and practical, and recommend that they should be prescribed by by-laws, or otherwise enforced.

Cattle.

(a) Each animal should be roped before being brought into the slaughter-chamber, which should be so arranged that the animal can be led in, straight up to the slaughter-ring, without having to be turned round. The turning round of a restive or excited animal, in order to get its head into the proper position for a right-handed blow, is not an easy matter, particularly if the floor is slippery, and, besides causing delay, is apt to lead to cruelty in the way of blows and tail twisting. The slaughter-ring should be affixed to the wall, about 2 feet from the ground, in such a position as to admit of a right-handed blow from the slaughterman. The common arrangement of fixing the slaughter-ring in the middle of the floor is not recommended, as it facilitates undesirable movement in the case of restive animals. The animal should be steadied by pressing his flank against the wall, and the head being secured to the ring at the same time, the possibility of movement is reduced to a minimum. This renders it more easy for the slaughterman to strike with accuracy.

(b) The Committee have practically tested a large number of appliances designed for felling and stunning animals previous to 'pithing.' Among these may be mentioned the Bruneau and Baxter masks, the Greener patent killer, the Blitz instrument, and the Wackett punch, all of which instantly stun and fell the animal and are recommended for use in the case of quiet cattle, or injured horses, particularly if the services of a trained slaughterman are not available.

In the case of wild or restive animals, however, the adjustment of these instruments is very difficult and their use is not recommended.

Without going into further details it will be sufficient to say that, whilst the Bruneau mask¹ has much to commend it—especially with inexperienced slaughtermen and when time is of little object—the Committee are of opinion that the poll-axe, when used by an expert, is, on the whole, the most satisfactory implement. In coming to this conclusion they must add that in the hands of a nervous or inexperienced man the poll-axe becomes an uncertain weapon, and may be productive of much suffering. The Committee, therefore, recommend that no man should be permitted to use the poll-axe on a living animal until he has gone through a thorough course of training, firstly, upon a dummy animal, and secondly, upon dead bodies.

(c) Except in the case of very restive animals, which may have to

¹ This appliance is used by the Army Service Corps, and forms part of the butcher's equipment issued to the troops on active service.

be stunned by a first blow on the poll, followed by a second stroke to perforate the forehead, one blow with the poll-axe on the forehead should be sufficient¹ to fell the animal and to cause instantaneous loss of sensibility. The animal should then at once be 'pithed' by thrusting a cane through the hole in the forehead and up the vertebræ, thus breaking up the spinal cord and ensuring absolute death. The animal should then be bled, and directly the bleeding is finished the carcase should be passed on into the 'dressing' room, as described in para. 8 (e). The slaughter space can then be flushed down ready for the next animal.

Calves.

Calves should first be stunned by a blow on the head with a club. A tackle can then be fastened to the hind legs, and the animal run up and bled, either by cutting its throat, or by cutting the head off. The usual practice in this country appears to be to run the animal up first, and then to stun it, previous to bleeding. This order of procedure is not so humane, and appears to be unnecessary.

Sheep.

The Committee have very carefully investigated the various methods of killing sheep. The usual method in this country is to lay the sheep on a wooden 'crutch,' and then to thrust a knife through the neck below the ears, and, with a second motion, to insert the point, from within, between the joints of the vertebræ, thus severing the spinal cord. In the hands of an expert this method is fairly rapid, but somewhat uncertain, the time which elapses between the first thrust of the knife and complete loss of sensibility varying, according to Professor Starling's observations, from five to thirty seconds. In the hands of an inexperienced operator it may be some time before death supervenes, and there can be little doubt that this method must be very painful to the sheep as long as consciousness remains. At the best it is a somewhat difficult operation, and yet in practice is often entrusted to the younger and less experienced hands in the slaughter-house, the probable reason being that sheep are easy to handle, and do not struggle or give trouble when stuck. In Denmark, many parts of Germany, and Switzerland the law requires that sheep shall always be stunned previous to being stuck, and the Committee have satisfied themselves by practical experiments and observation that this can be done expeditiously and without difficulty. A small club, with a heavy head² should be used, and the sheep should be struck on the top of the

¹ It is very seldom that an expert, or properly trained slaughterman, need to strike more than one blow with a poll-axe. In any case, however, the first blow, if strongly delivered, is almost certain to fell and stun the animal, even if a second blow should be necessary to make the hole for the pithing cane.

² The Copenhagen instrument, with which the Committee conducted successful experiments, has a wooden handle and a rounded iron head. The

head between the ears. *This point is important, as it is almost impossible to stun a sheep by striking it on the forehead.* The sheep are previously placed on the crutch, and directly they are stunned they are stuck with a knife and bled in the ordinary way. It was ascertained that complete loss of sensibility from the stunning alone lasted for at least twenty seconds, which allows more than ample time for the completion of the killing operation. It was also clearly demonstrated that the stunning caused no injury to the sheep's head, or to the 'scrag of mutton,' which could in any way depreciate their market value.

Lambs.

Lambs should also be stunned previous to bleeding, but a lighter club should be used.

Pigs.

The Committee ascertained that it is the usual practice in large establishments in England to stun pigs by a blow on the forehead, previous to sticking them, and there is no difficulty in carrying this out, as the pig's head is soft as compared with that of the sheep. The Committee are of opinion that the preliminary stunning should be enforced in all cases, the evidence tending to show that this operation is often limited to pigs which are so large or strong as to give trouble to the sticker, or to cases where, owing to the location of the slaughter-house, the squeals of the stuck pigs cause annoyance to the neighbourhood. The Committee feel that considerations of humanity are at least as important as those above mentioned.

JEWISH METHOD OF SLAUGHTER.

11. The Committee feel it their duty to make a special reference to the Jewish method of slaughtering cattle. They are aware that in dealing with this subject they cannot help trenching upon very delicate ground, but it has been their earnest desire to avoid, as far as possible, giving any offence to Jewish susceptibilities. They feel, however, that considerations of humanity must be regarded as paramount, and that no unnecessary suffering could be condoned on the ground that it was incidental to the observance of any religious custom. They are fully convinced that the Jews have no desire to kill their cattle in anything but a humane manner; the only question, therefore, with which the Committee had to deal was whether the Jewish method, as commonly practised, is, as a matter of fact, humane, or at any rate not less humane than other methods.

12. The Committee have had the advantage of hearing the views of the Chief Rabbi of the Jewish Congregations, as well as of the Pre-

Swiss instrument is the one recommended for general use, as it requires less skill on the part of the operator and, consequently, is more certain in its effects.

sident of the Shechita Board, on this subject, and they have also studied the able treatise prepared by Dr. Dembo in defence of the Jewish system. After the most careful consideration, however, and after receiving the Report of two such eminent physiologists as Sir Michael Foster and Professor Starling, the Committee have been forced to the following conclusions:—

(a) That the Jewish system fails in the primary requirements of rapidity, freedom from unnecessary pain, and instantaneous loss of sensibility, and that it compares very unfavourably with the methods of stunning recommended by the Committee in paragraph 10.

(b) That the preliminary operations of 'casting,'¹ and of forcing the animal's head into position for the cut, are difficult, painful, and objectionable from a humanitarian standpoint.

(c) That the subsequent operation of cutting the throat is at best an uncertain method of producing immediate loss of sensibility, and frequently causes great and unduly prolonged suffering to the animal.

(d) That, until some method is devised, and adopted, for rendering the animal unconscious, previous to the 'casting' and throat-cutting operations, the Jewish system of slaughtering cattle should not be permitted in any establishment under Government control.

NECESSITY FOR OFFICIAL SUPERVISION.

13. However human and scientific in theory may be the methods of slaughter, it is inevitable that abuses and cruelty may result in practice, unless there is a proper system of official supervision. This can only be satisfactorily effected in public abattoirs, which it is hoped will eventually become the only legal places of slaughter, but the Committee are of opinion that much might be done in the meantime by the local urban and rural authorities, if they took full advantage of the powers entrusted to them under the existing laws. In this connection special attention is drawn to an interesting memorandum prepared for the Committee by the Local Government Board. From this it will be seen that private slaughter-houses, even in country districts, are not altogether beyond the reach of the local authority.

PROPOSED REGULATIONS.

14. In many towns bye-laws have been drawn up regulating the methods of slaughter in public abattoirs [as, for example, the London County Council]. The Committee are of opinion, however, that the clauses dealing with the *methods* of slaughter could with advantage

¹ It should be mentioned that, as a result of the enquiries of the Committee, the President of the Shechita Board has now ordered twenty-one india-rubber pavements to be laid down in the Deptford slaughter-houses, in order to break the fall of cattle when 'cast' in the Jewish method.

be further defined, and they suggest the following clauses which they would like to see universally adopted and strictly enforced.

(a) All animals, without exception, must be stunned, or otherwise rendered unconscious, before blood is drawn.

(b) Animals awaiting slaughter must be so placed that they cannot see into the slaughter-house, and the doors of the latter must be kept closed whilst slaughtering is going on.

(c) The drainage of the slaughter-house must be so arranged that no blood or other refuse can flow out within the sight or smell of animals awaiting slaughter, and no such refuse shall be deposited in proximity to the waiting pens.

(d) If more animals than one are being slaughtered in one slaughter-house at the same time, they must not be within view of each other.

(e) None but licensed men shall be employed in or about slaughter-houses.

15. The power of regulating slaughter-houses by bye-laws can be conferred by the Local Government Board on a rural district council, which latter has consequently the power to regulate and supervise private slaughter-houses in country districts. The Committee consider that this fact is of great importance, and they express the earnest hope that rural authorities will take fuller advantage of these powers than they have done hitherto, and will take steps to adopt and enforce byelaws, in harmony with those suggested in the previous paragraph.

EXTRACTS FROM LOCAL BYELAWS : LONDON COUNTY COUNCIL.

1. An occupier of a slaughter-house—

* * * * *

(d) Shall not keep in any pound, pen, or lair, any animal for a longer period than may be necessary for the purpose of preparing such animal for slaughter.

(e) Shall provide every animal in a pound, pen, or lair, with a sufficient quantity of wholesome water and food.

2. An occupier of a slaughter-house—

(a) Shall not slaughter or permit to be slaughtered any animal in any pound, pen, or lair, or in any part of the premises other than the slaughter-house.

(b) Shall in slaughtering any animal use such instruments and appliances, and adopt such method of slaughtering, and otherwise take such precautions as may be requisite to prevent unnecessary suffering to the animal.

(c) Shall not slaughter or permit to be slaughtered any animal within public view, or within the view of any other animal.

* * * * *

SALE OF FOOD AND DRUGS ACT, 1875.

AN ACT TO REPEAL THE ADULTERATION OF FOOD ACTS, AND TO
MAKE BETTER PROVISION FOR THE SALE OF FOOD AND
DRUGS IN A PURE STATE.

(11TH AUGUST, 1873.)

WHEREAS it is desirable that the Acts now in force relating to the adulteration of food should be repealed, and that the law regarding the sale of food and drugs in a pure and genuine condition should be amended :

Be it therefore enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :

Repeal of Statutes.

1. From the commencement of this Act the statutes of the twenty-third and twenty-fourth of Victoria, chapter eighty-four, of the thirty-first and thirty-second of Victoria, chapter one hundred and twenty-one, section twenty-four, of the thirty-third and thirty-fourth of Victoria, chapter twenty-six, section three, and of the thirty-fifth and thirty-sixth of Victoria, chapter seventy-four, shall be repealed except in regard to any appointment made under them and not then determined, and in regard to any offence committed against them or any prosecution or other act commenced and not concluded or completed, and any payment of money then due in respect of any provision thereof.

Interpretation of Words.

2. The term 'food' shall include every article used for food or drink by man, other than drugs or water :

The term 'drug' shall include medicine for internal or external use :

The term 'county' shall include every county, riding, and division, as well as every county of a city or town not being a borough :

The term 'justices' shall include any police and stipendiary magistrate invested with the powers of a justice of the peace in England, and any divisional justices in Ireland.

DESCRIPTION OF OFFENCES.

Prohibition of the Mixing of Injurious Ingredients, and of Selling the Same.

3. No person shall mix, colour, stain, or powder, or order or permit any other person to mix, colour, stain, or powder, any article of food with any ingredient or material so as to render the article injurious to health, with intent that the same may be sold in that state, and no

person shall sell any such article so mixed, coloured, stained, or powdered, under a penalty in each case not exceeding fifty pounds for the first offence; every offence, after a conviction for a first offence, shall be a misdemeanor, for which the person, on conviction, shall be imprisoned for a period not exceeding six months with hard labour.

Prohibition of the Mixing of Drugs with Injurious Ingredients, and of Selling the Same.

4. No person shall, except for the purpose of compounding as herein-after described, mix, colour, stain, or powder, or order or permit any other person to mix, colour, stain, or powder, any drug with any ingredient or material so as to affect injuriously the quality or potency of such drug, with intent that the same may be sold in that state, and no person shall sell any such drug so mixed, coloured, stained, or powdered, under the same penalty in each case respectively as in the preceding section for a first and subsequent offence.

Exemption in Case of Proof of Absence of Knowledge.

5. Provided that no person shall be liable to be convicted under either of the two last foregoing sections of this Act in respect of the sale of any article of food, or of any drug, if he shows to the satisfaction of the justice or court before whom he is charged that he did not know of the article of food or drug sold by him being so mixed, coloured, stained, or powdered as in either of those sections mentioned, and that he could not with reasonable diligence have obtained that knowledge.

Prohibition of the Sale of Articles of Food and of Drugs not of the Proper Nature, Substance, and Quality.

6. No person shall sell to the prejudice of the purchaser any article of food or any drug which is not of the nature, substance, and quality of the article demanded by such purchaser, under a penalty not exceeding twenty pounds; provided that an offence shall not be deemed to be committed under this section in the following cases; that is to say,

(1.) Where any matter or ingredient not injurious to health has been added to the food or drug because the same is required for the production or preparation thereof as an article of commerce, in a state fit for carriage or consumption and not fraudulently to increase the bulk, weight, or measure of the food or drug, or conceal the inferior quality thereof;

(2.) Where the drug or food is a proprietary medicine, or is the subject of a patent in force, and is supplied in the state required by the specification of the patent;

(3.) Where the food or drug is compounded as in this Act mentioned;

(4.) Where the food or drug is unavoidably mixed with some extraneous matter in the process of collection or preparation.

Provision for the Sale of Compounded Articles of Food and Compounded Drugs.

7. No person shall sell any compound article of food or compounded drug which is not composed of ingredients in accordance with the demand of the purchaser, under a penalty not exceeding twenty pounds.

Protection from Offences by Giving of Label.

8. Provided that no person shall be guilty of any such offence as aforesaid in respect of the sale of an article of food or a drug mixed with any matter or ingredient not injurious to health, and not intended fraudulently to increase its bulk, weight, or measure, or conceal its inferior quality, if at the time of delivering such article or drug he shall supply to the person receiving the same a notice, by a label distinctly and legibly written or printed on or with the article or drug, to the effect that the same is mixed.

Prohibition of the Abstraction of any Part of an Article of Food before Sale, and Selling without Notice.

9. No person shall, with the intent that the same may be sold in its altered state without notice, abstract from an article of food any part of it so as to affect injuriously its quality, substance, or nature, and no person shall sell any article so altered without making disclosure of the alteration, under a penalty in each case not exceeding twenty pounds.

APPOINTMENT AND DUTIES OF ANALYSTS, AND PROCEEDINGS TO OBTAIN ANALYSIS.

10. In the city of London and the liberties thereof the Commissioners of Sewers of the city of London and the liberties thereof, and in all other parts of the metropolis the vestries and district boards acting in execution of the Act for the better local management of the metropolis, the court of quarter sessions of every county, and the town council of every borough having a separate court of quarter sessions, or having under any general or local Act of Parliament or otherwise a separate police establishment, may, as soon as convenient after the passing of this Act, where no appointment has been hitherto made, and in all cases as and when vacancies in the office occur, or when required so to do by the Local Government Board, shall, for their respective city, districts, counties, or boroughs, appoint one or more persons possessing competent knowledge, skill, and experience, as analysts of all articles of food and drugs sold within the said city, metropolitan districts, counties, or boroughs, and shall pay to such analysts such remuneration as shall be mutually agreed upon, and may remove him or them

as they shall deem proper ; but such appointments and removals shall at all times be subject to the approval of the Local Government Board, who may require satisfactory proof of competency to be supplied to them, and may give their approval absolutely or with modifications as to the period of the appointment and removal, or otherwise : Provided that no person shall hereafter be appointed an analyst for any place under this section who shall be engaged directly or indirectly in any trade or business connected with the sale of food or drugs in such place.

In Scotland the like powers shall be conferred and the like duties shall be imposed upon the commissioners of supply at their ordinary meetings for counties, and the commissioners or boards of police, or where there are no such commissioners or boards, upon the town councils for boroughs within their several jurisdictions ; provided that one of Her Majesty's Principal Secretaries of State in Scotland shall be substituted for the Local Government Board of England.

In Ireland the like powers and duties shall be conferred and imposed respectively upon the grand jury of every county and town council of every borough ; provided that the Local Government Board of Ireland shall be substituted for the Local Government Board of England.

Town Council of a Borough may engage the Analyst of another Borough or of the County.

11. The town council of any borough may agree that the analyst appointed by any neighbouring borough or for the county in which the borough is situated, shall act for their borough during such time as the said council shall think proper, and shall make due provision for the payment of his remuneration, and if such analyst shall consent, he shall during such time be the analyst for such borough for the purposes of this Act.

Power to Purchaser of an Article of Food to have it Analysed.

12. Any purchaser of an article of food or of a drug in any place being a district, county, city, or borough where there is any analyst appointed under this or any Act hereby repealed shall be entitled, on payment to such analyst of a sum not exceeding ten shillings and sixpence, or if there be no such analyst then acting for such place, to the analyst of another place, of such sum as may be agreed upon between such person and the analyst, to have such article analysed by such analyst, and to receive from him a certificate of the result of his analysis.

Officer named to obtain a Sample of Food or Drug to submit to Analyst.

13. Any medical officer of health, inspector of nuisances, or inspector of weights and measures, or any inspector of a market or any police

constable under the direction and at the cost of the local authority appointing such officer, inspector, or constable, or charged with the execution of this Act, may procure any sample of food or drugs, and if he suspect the same to have been sold to him contrary to any provision of this Act, shall submit the same to be analysed by the analyst of the district or place for which he acts, or if there be no such analyst then acting for such place to the analyst of another place, and such analyst shall upon receiving payment as is provided in the last section, with all convenient speed analyse the same and give a certificate to such officer, wherein he shall specify the result of the analysis.

Provision for Dealing with the Sample when Purchased.

14. The person purchasing any article with the intention of submitting the same to analysis shall, after the purchase shall have been completed, forthwith notify to the seller or his agent selling the article his intention to have the same analysed by the public analyst, and shall offer to divide the article into three parts to be then and there separated, and each part to be marked and sealed or fastened up in such manner as its nature will permit, and shall, if required to do so, proceed accordingly, and shall deliver one of the parts to the seller or his agent.

He shall afterwards retain one of the said parts for future comparison and submit the third part, if he deems it right to have the article analysed, to the analyst.

Provision when Sample is not Divided.

15. If the seller or his agent do not accept the offer of the purchaser to divide the article purchased in his presence, the analyst receiving the article for analysis shall divide the same into two parts, and shall seal or fasten up one of those parts, and shall cause it to be delivered, either upon receipt of the sample or when he supplies his certificate to the purchaser, who shall retain the same for production in case proceedings shall afterwards be taken in the matter.

Provision for sending Article to the Analyst through the Post Office.

16. If the analyst do not reside within two miles of the residence of the person requiring the article to be analysed, such article may be forwarded to the analyst through the post office as a registered letter, subject to any regulations which the Postmaster General may make in reference to the carrying and delivery of such article, and the charge for the postage of such article shall be deemed one of the charges of this Act or of the prosecution, as the case may be.

Person refusing to Sell any Article to any Officer liable to Penalty.

17. If any such officer, inspector, or constable, as above described, shall apply to purchase any article of food or any drug exposed to sale, or on sale by retail on any premises or in any shop or stores, and shall tender the price for the quantity which he shall require for the purpose of analysis, not being more than shall be reasonably requisite, and the person exposing the same for sale shall refuse to sell the same to such officer, inspector, or constable, such person shall be liable to a penalty not exceeding ten pounds.

Form of the Certificate.

18. The certificate of the analysis shall be in the form set forth in the schedule hereto, or to the like effect.

Quarterly Report of the Analyst.

19. Every analyst appointed under any Act hereby repealed or this Act shall report quarterly to the authority appointing him the number of articles analysed by him under this Act during the foregoing quarter, and shall specify the result of each analysis and the sum paid to him in respect thereof, and such report shall be presented at the next meeting of the authority appointing such analyst, and every such authority shall annually transmit to the Local Government Board, at such time and in such form as the Board shall direct, a certified copy of such quarterly report.

PROCEEDINGS AGAINST OFFENDERS.

20. When the analyst having analysed any article shall have given his certificate of the result, from which it may appear that an offence against some one of the provisions of this Act has been committed, the person causing the analysis to be made may take proceedings for the recovery of the penalty herein imposed for such offence, before any justices in petty sessions assembled having jurisdiction in the place where the article or drug sold was actually delivered to the purchaser, in a summary manner.

Every penalty imposed by this Act shall be recovered in England in the manner prescribed by the eleventh and twelfth of Victoria, chapter forty-three. In Ireland such penalties and proceedings shall be recoverable, and may be taken with respect to the police district of Dublin metropolis, subject and according to the provisions of any Act regulating the powers and duties of justices of the peace for such district, or of the police of such district; and with respect to other parts of Ireland, before a justice or justices of the peace sitting in petty sessions, subject and according to the provisions of 'The Petty Sessions (Ireland) Act, 1851,' and any Act amending the same.

Every penalty herein imposed may be reduced or mitigated according to the judgment of the justices.

Certificate of Analyst Prima Facie Evidence for the Prosecution, but Analyst to be called if required. Defendant and his Wife may be examined.

21. At the hearing of the information in such proceeding the production of the certificate of the analyst shall be sufficient evidence of the facts therein stated, unless the defendant shall require that the analyst shall be called as a witness, and the parts of the articles retained by the person who purchased the article shall be produced, and the defendant may, if he think fit, tender himself and his wife to be examined on his behalf, and he or she shall, if he so desire, be examined accordingly.

Power to Justices to have Articles of Food and Drug Analysed.

22. The justices before whom any complaint may be made, or the court before whom any appeal may be heard, under this Act may, upon the request of either party, in their discretion cause any article of food or drug to be sent to the Commissioners of Inland Revenue, who shall thereupon direct the chemical officers of their department at Somerset House to make the analysis, and give a certificate to such justices of the result of the analysis ; and the expense of such analysis shall be paid by the complainant or the defendant as the justices may by order direct.

Appeal to Quarter Sessions.

23. Any person who has been convicted of any offence punishable by any Act hereby repealed or by this Act by any justices may appeal in England to the next general or quarter sessions of the peace which shall be held for the city, county, town, or place wherein such conviction shall have been made, provided that such person enter into a recognizance within three days next after such conviction, with two sufficient sureties, conditioned to try such appeal, and to be forthcoming to abide the judgment and determination of the court at such general or quarter sessions, and to pay such costs as shall be by such court awarded ; and the justices before whom such conviction shall be had are hereby empowered and required to take such recognizance ; and the court at such general or quarter sessions are hereby required to hear and determine the matter of such appeal, and may award such costs to the party appealing or appealed against as they or he shall think proper.

In Ireland any person who has been convicted of any offence punishable by this Act may appeal to the next court of quarter sessions to be held in the same division of the county where the conviction shall be made by any justice or justices in any petty sessions district, or to the

recorder at his next sessions where the conviction shall be made by the divisional justices in the police district of Dublin metropolis, or to the recorder of any corporate or borough town when the conviction shall be made by any justice or justices in such corporate or borough town (unless when any such sessions shall commence within ten days from the date of any such conviction, in which case if the appellant sees fit, the appeal may be made to the next succeeding sessions to be held for such division or town), and it shall be lawful for such court of quarter sessions or recorder (as the case may be) to decide such appeal, if made in such form and manner and with such notices as are required by the Petty Sessions Acts respectively herein-before mentioned as to appeals against orders made by justices at petty sessions, and all the provisions of the said Petty Sessions Acts respectively as to making appeals and as to executing the orders made on appeal, or the original orders where the appeals shall not be duly prosecuted, shall also apply to any appeal made under this Act.

In any Prosecution Defendant to Prove that he is Protected by Exception or Provision.

24. In any prosecution under this Act, where the fact of an article having been sold in a mixed state has been proved if the defendant shall desire to rely upon any exception or provision contained in this Act, it shall be incumbent upon him to prove the same.

Defendant to be Discharged if he Prove that he Bought the Article in the Same State as Sold, and with a Warranty. No Costs except on Issues proved against him.

25. If the defendant in any prosecution under this Act prove to the satisfaction of the justices or court that he had purchased the article in question as the same in nature, substance, and quality as that demanded of him by the prosecutor, and with a written warranty to that effect, that he had no reason to believe at the time when he sold it that the article was otherwise, and that he sold it in the same state as when he purchased it he shall be discharged from the prosecution, but shall be liable to pay the costs incurred by the prosecutor, unless he shall have given due notice to him that he will rely on the above defence.

Application of Penalties.

26. Every penalty imposed and recovered under this Act shall be paid in the case of a prosecution by an officer, inspector, or constable of the authority who shall have appointed an analyst or agreed to the acting of an analyst within their district, to such officer, inspector, or constable, and shall be by him paid to the authority for whom he acts, and be applied towards the expenses of executing this Act, any Statute to the contrary notwithstanding; but in the case of any other prosecu-

tion the same shall be paid and applied in England according to the law regulating the application of penalties for offences punishable in a summary manner, and in Ireland in the manner directed by the Fines Act, Ireland, 1851, and the Acts amending the same.

Punishment for Forging Certificate or Warranty; for Wilful Misapplication of Warranty; for False Warranty; for False Label.

27. Any person who shall forge, or shall utter, knowing it to be forged for the purposes of this Act, any certificate or any writing purporting to contain a warranty, shall be guilty of a misdemeanor and be punishable on conviction by imprisonment for a term of not exceeding two years with hard labour.

Every person who shall wilfully apply to an article of food, or a drug, in any proceedings under this Act, a certificate or warranty given in relation to any other article or drug, shall be guilty of an offence under this Act, and be liable to a penalty not exceeding twenty pounds;

Every person who shall give a false warranty in writing to any purchaser in respect of an article of food or a drug sold by him as principal or agent, shall be guilty of an offence under this Act, and be liable to a penalty not exceeding twenty pounds;

And every person who shall wilfully give a label with any article sold by him which shall falsely describe the article sold, shall be guilty of an offence under this Act, and be liable to a penalty not exceeding twenty pounds.

Proceedings by Indictment and Contracts not to be Affected.

28. Nothing in this Act contained shall affect the power of proceeding by indictment, or take away any other remedy against any offender under this Act, or in any way interfere with contracts and bargains between individuals, and the rights and remedies belonging thereto.

Provided that in any action brought by any person for a breach of contract on the sale of any article of food or of any drug, such person may recover alone or in addition to any other damages recoverable by him the amount of any penalty in which he may have been convicted under this Act, together with the costs paid by him upon such conviction and those incurred by him in and about his defence thereto, if he prove that the article or drug the subject of such conviction was sold to him as and for an article or drug of the same nature, substance, and quality as that which was demanded of him, and that he purchased it not knowing it to be otherwise, and afterwards sold it in the same state in which he purchased it; the defendant in such action being nevertheless at liberty to prove that the conviction was wrongful, or that the amount of costs awarded or claimed was unreasonable.

EXPENSES OF EXECUTING THE ACT.

29. The expenses of executing this Act shall be borne, in the city of London and the liberties thereof, by the consolidated rates raised by the Commissioners of Sewers of the city of London and the liberties thereof, and in the rest of the metropolis by any rates or funds applicable to the purposes of the Act for the better local management of the metropolis, and otherwise as regards England, in counties by the county rate, and in boroughs by the borough fund or rate;

And as regards Ireland, in counties by the grand jury cess, and in boroughs by the borough fund or rate; all such expenses payable in any county out of grand jury cess shall be paid by the treasurer of such county; and

The grand jury of any such county shall, at any assizes at which it is proved that any such expenses have been incurred or paid without previous application to presentment sessions, present to be raised off and paid by such county the moneys required to defray the same.

SPECIAL PROVISIONS AS TO TEA.

30. From and after the first day of January one thousand eight hundred and seventy-six all tea imported as merchandise into and landed at any port in Great Britain or Ireland shall be subject to examination by persons to be appointed by the Commissioners of Customs, subject to the approval of the Treasury, for the inspection and analysis thereof, for which purpose samples may, when deemed necessary by such inspectors, be taken and with all convenient speed be examined by the analysts to be so appointed; and if upon such analysis the same shall be found to be mixed with other substances or exhausted tea, the same shall not be delivered unless with the sanction of the said commissioners, and on such terms and conditions as they shall see fit to direct, either for home consumption or for use as ships' stores or for exportation; but if on such inspection and analysis it shall appear that such tea is in the opinion of the analyst unfit for human food, the same shall be forfeited and destroyed or otherwise disposed of in such manner as the said commissioners may direct.

Interpretation of Act.

31. Tea to which the term 'exhausted' is applied in this Act shall mean and include any tea which has been deprived of its proper quality, strength, or virtue by steeping, infusion, decoction, or other means.

Provision for the Liberty of a Cinque Port.

32. For the purposes of this Act every liberty of a cinque port not comprised within the jurisdiction of a borough shall be part of the county in which it is situated, and subject to the jurisdiction of the justices of such county.

Application of the Act to Scotland.

33. In the application of this Act to Scotland the following provisions shall have effect :

(1) The term 'misdemeanor' shall mean 'a crime or offence' :

(2) The term 'defendant' shall mean 'defender' and include 'respondent' :

(3) The term 'information' shall include 'complaint' :

(4) This Act shall be read and construed as if for the term 'justices,' wherever it occurs therein, the term 'sheriff' were substituted :

(5) The term 'sheriff' shall include 'sheriff substitute' :

(6) The term 'borough' shall mean any royal burgh and any burgh returning or contributing to return a member to Parliament :

(7) The expenses of executing this Act shall be borne in Scotland, in counties, by the county general assessment, and in burghs by the police assessment :

(8) This Act shall be read and construed as if for the expression 'the Local Government Board,' wherever it occurs therein, the expression 'one of Her Majesty's Principal Secretaries of State' were substituted :

(9) All penalties provided by this Act to be recovered in a summary manner shall be recovered before the sheriff of the county in the sheriff court, or at the option of the person seeking to recover the same in the police court, in any place where a sheriff officiates as a police magistrate under the provisions of 'The Summary Procedure Act, 1864,' or of the Police Act in force for the time in any place in which a sheriff officiates as aforesaid, and all the jurisdiction, powers, and authorities necessary for this purpose are hereby conferred on sheriffs :

Every such penalty may be recovered at the instance of the procurator fiscal of the jurisdiction, or of the person who caused the analysis to be made from which it appeared that an offence had been committed against some one of the provisions of this Act :

Every penalty imposed and recovered under this Act shall be paid to the clerk of court, and by him shall be accounted for and paid to the treasurer of the county general assessment, or the police assessment of the burgh, as the sheriff shall direct :

(10) Every penalty imposed by this Act may be reduced or mitigated according to the judgment of the sheriff :

(11) It shall be competent to any person aggrieved by any conviction by a sheriff in any summary proceeding under this Act to appeal against the same to the next circuit court, or where there are no circuit courts to the High Court of Justiciary at Edinburgh, in the manner prescribed by such of the provisions of the Act of the twentieth year of the reign of King George the second, chapter forty-three, and any Acts amending

the same, as relate to appeals in matters criminal, and by and under the rules, limitations, conditions, and restrictions contained in the said provisions.

Interpretation of Terms in Application of Act to Ireland.

34. In the application of this Act to Ireland,—

The term ‘borough’ shall mean any borough subject to the Act of the session of the third and fourth years of the reign of Her present Majesty, chapter one hundred and eight, intituled ‘An Act for the regulation of Municipal Corporations in Ireland’ :

The term ‘county’ shall include a county of a city and a county of a town not being a borough :

The term ‘assizes’ shall, with respect to the county of Dublin, mean ‘presenting term’ :

The term ‘treasurer of the county’ shall include any person or persons or bank in any county performing duties analogous to those of the treasurer of the county in counties, and, with respect to the county of Dublin, it shall mean the finance committee :

The term ‘police constable’ shall mean, with respect to the police district of Dublin metropolis, constable of the Dublin Metropolitan Police, and with respect to any other part of Ireland, constable of the Royal Irish Constabulary.

Commencement of the Act.

35. This Act shall commence on the first day of October one thousand eight hundred and seventy-five.

Title of the Act.

36. This Act may be cited as ‘The Sale of Food and Drugs Act, 1875.’

SALE OF FOOD AND DRUGS ACT, 1879.

AN ACT TO AMEND THE SALE OF FOOD AND DRUGS ACT, 1875.

(21ST JULY, 1879.)

WHEREAS conflicting decisions have been given in England and in Scotland in regard to the meaning and effect of section six of the Sale of Food and Drugs Act, 1875 [38 & 39 Vict. c. 63], in this Act referred to as the principal Act, and it is expedient, in this respect and otherwise, to amend the said Act: Be it enacted by the Queen’s most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :

Short Title.

1. This Act may be cited for all purposes as the Sale of Food and Drugs Act Amendment Act, 1879.

In Sale of Adulterated Articles no Defence to allege Purchase for Analysis.

2. In any prosecution under the provisions of the principal Act for selling to the prejudice of the purchaser any article of food or any drug which is not of the nature, substance, and quality of the article demanded by such purchaser, it shall be no defence to any such prosecution to allege that the purchaser, having bought only for analysis, was not prejudiced by such sale. Neither shall it be a good defence to prove that the article of food or drug in question, though defective in nature or in substance or in quality, was not defective in all three respects.

Officer, Inspector, or Constable may obtain a Sample of Milk at the Place of Delivery to submit to Analyst.

3. Any medical officer of health, inspector of nuisances, or inspector of weights and measures, or any inspector of a market, or any police constable under the direction and at the cost of the local authority appointing such officer, inspector, or constable, or charged with the execution of this Act, may procure at the place of delivery any sample of any milk in course of delivery to the purchaser or consignee in pursuance of any contract for the sale to such purchaser or consignee of such milk; and such officer, inspector, or constable, if he suspect the same to have been sold contrary to any of the provisions of the principal Act, shall submit the same to be analysed, and the same shall be analysed, and proceedings shall be taken, and penalties on conviction be enforced in like manner in all respects as if such officer, inspector, or constable had purchased the same from the seller or consignor under section thirteen of the principal Act.

Penalty for Refusal to give Milk for Analysis.

4. The seller or consignor or any person or persons entrusted by him for the time being with the charge of such milk, if he shall refuse to allow such officer, inspector, or constable to take the quantity which such officer, inspector, or constable shall require for the purpose of analysis, shall be liable to a penalty not exceeding ten pounds.

Extension of Act as to Sale in Streets, etc.

5. Any street or open place of public resort shall be held to come within the meaning of section seventeen of the principal Act.

Reduction allowed to the Extent of 25 Degrees under Proof for Brandy, Whisky, or Rum, and 35 Degrees for Gin.

6. In determining whether an offence has been committed under section six of the said Act by selling, to the prejudice of the purchaser, spirits not adulterated otherwise than by the admixture of water, it

shall be a good defence to prove that such admixture has not reduced the spirit more than twenty-five degrees under proof for brandy, whisky, or ruin, or thirty-five degrees under proof for gin.

Extension of Meaning of 'County.'

7. Every liberty having a separate court of quarter sessions, except a liberty of a cinque port, shall be deemed to be a county within the meaning of the said Act.

Quarter Sessions Boroughs not to contribute to County Analysis.

8. The town council of any borough having a separate court of quarter sessions shall be exempt from contributing towards the expenses incurred in the execution of the principal Act in respect to the county within which such borough is situate, and the treasurer of the county shall exclude the expenses so incurred from the account required by section one hundred and seventeen of the Municipal Corporations Act, 1835, to be sent by him to such town council.

Provisions for Boroughs with Separate Police.

9. The town council of any borough having under any general or local Act of Parliament, or otherwise, a separate police establishment, and being liable to be assessed to the county rate of the county within which the borough is situate, shall be paid by the justices of such county the proportionate amount contributed towards the expenses incurred by the county in the execution of the principal Act by the several parishes and parts of parishes within such borough in respect of the rateable value of the property assessable therein, as ascertained by the valuation lists for the time being in force.

Special Provision as to Time for Proceedings.

10. In all prosecutions under the principal Act, and notwithstanding the provisions of section twenty of the said Act, the summons to appear before the magistrates shall be served upon the person charged with violating the provisions of the said Act within a reasonable time, and in the case of a perishable article not exceeding twenty-eight days from the time of the purchase from such person for test purposes of the food or drug, for the sale of which in contravention to the terms of the principal Act the seller is rendered liable to prosecution, and particulars of the offence or offences against the said Act of which the seller is accused, and also the name of the prosecutor, shall be stated on the summons, and the summons shall not be made returnable in a less time than seven days from the day it is served upon the person summoned.

SALE OF FOOD AND DRUGS ACT, 1899.

AN ACT TO AMEND THE LAW RELATING TO THE SALE OF FOOD AND DRUGS.

(9TH AUGUST, 1899.)

BE it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows :

Precautions against Importation of Agricultural and Other Produce insufficiently marked.

1.—(1.) If there is imported into the United Kingdom any of the following articles, namely :—

- (a) margarine or margarine-cheese, except in packages conspicuously marked 'Margarine' or 'Margarine-cheese,' as the case may require ; or
- (b) adulterated or impoverished butter (other than margarine) or adulterated or impoverished milk or cream, except in packages or cans conspicuously marked with a name or description indicating that the butter or milk or cream has been so treated ; or
- (c) condensed separated or skimmed milk, except in tins or other receptacles which bear a label whereon the words 'Machine-skimmed Milk' or 'Skimmed Milk,' as the case may require, are printed in large and legible type ; or
- (d) any adulterated or impoverished article of food to which Her Majesty may by Order in Council direct that this section shall be applied, unless the same be imported in packages or receptacles conspicuously marked with a name or description indicating that the article has been so treated ;

the importer shall be liable, on summary conviction, for the first offence to a fine not exceeding twenty pounds, for the second offence to a fine not exceeding fifty pounds, and for any subsequent offence to a fine not exceeding one hundred pounds.

(2.) The word 'importer' shall include any person who, whether as owner, consignor, or consignee, agent, or broker, is in possession of, or in anywise entitled to the custody or control of, the article ; prosecutions for offences under this section shall be undertaken by the Commissioners of Customs ; and subject to the provisions of this Act this section shall have effect as if it were part of the Customs Consolidation Act, 1876 [39 & 40 Vict. c. 36].

(3.) The Commissioners of Customs shall, in accordance with directions given by the Treasury after consultation with the Board of

Agriculture, take such samples of consignments of imported articles of food as may be necessary for the enforcement of the foregoing provisions of this section.

(4.) Where the Commissioners of Customs take a sample of any consignment in pursuance of such directions they shall divide it into not less than three parts, and send one part to the importer and one part to the principal chemist of the Government laboratories, and retain one part.

(5.) In any proceeding under this section the certificate of the principal chemist of the result of the analysis shall be sufficient evidence of the facts therein stated, unless the defendant require that the person who made the analysis be called as a witness.

(6.) If, in any case, the Commissioners of Customs are of opinion that an offence against this section has been committed, they shall communicate to the Board of Agriculture for their information the name of the importer and such other facts as they possess or may obtain as to the destination of the consignment.

(7.) For the purposes of this section an article of food shall be deemed to be adulterated or impoverished if it has been mixed with any other substance, or if any part of it has been abstracted so as in either case to affect injuriously its quality, substance, or nature.

Provided that an article of food shall not be deemed to be adulterated by reason only of the addition of any preservative or colouring matter of such a nature and in such quantity as not to render the article injurious to health.

Power for Local Government Board or Board of Agriculture to sample Articles of Food.

2.—(1.) The Local Government Board may, in relation to any matter appearing to that Board to affect the general interest of the consumer, and the Board of Agriculture may, in relation to any matter appearing to that Board to affect the general interests of agriculture in the United Kingdom, direct an officer of the Board to procure for analysis samples of any article of food, and thereupon the officer shall have all the powers of procuring samples conferred by the Sale of Food and Drugs Acts, and those Acts shall apply as if the officer were an officer authorised to procure samples under the Sale of Food and Drugs Act, 1875, except that—

- (a) the officer procuring the sample shall divide the same into four parts, and shall deal with three of such parts in the manner directed by section fourteen of the Sale of Food and Drugs Act, 1875, as amended by this Act, and shall send the fourth part to the Board, and
- (b) the fee for analysis shall be payable to the analyst by the local authority of the place where the sample is procured.

(2.) The Board shall communicate the result of the analysis of any such sample to the local authority, and thereupon there shall be the like duty and power on the part of the local authority to cause proceedings to be taken as if the local authority had caused the analysis to be made.

Power for Local Government Board or Board of Agriculture to act in Default of Local Authority.

3.—(1.) It shall be the duty of every local authority entrusted with the execution of the laws relating to the sale of food and drugs to appoint a public analyst, and put in force from time to time, as occasion may arise, the powers with which they are invested, so as to provide proper securities for the sale of food and drugs in a pure and genuine condition, and in particular to direct their officers to take samples for analysis.

(2.) If the Local Government Board or Board of Agriculture, after communication with the local authority, are of opinion that the local authority have failed to execute or enforce any of the provisions of the Sale of Food and Drugs Acts in relation to any article of food, and that their failure affects the general interest of the consumer or the general interests of agriculture in the United Kingdom, as the case may be, the Board concerned may, by order, empower an officer of the Board to execute and enforce those provisions or to procure the execution and enforcement thereof in relation to any article of food mentioned in the order.

(3.) The expenses incurred by the Board or their officer under any such order shall be treated as expenses incurred by the local authority in the execution of the said Acts, and shall be paid by the local authority to the Board on demand, and in default the Board may recover the amount of the expenses with costs from the local authority.

(4.) For the purposes of this section an order of the Board shall be conclusive in respect of any default, amount of expenses, or other matter therein stated or appearing.

(5.) Any public analyst appointed under the Sale of Food and Drugs Acts shall furnish such proof of competency as may from time to time be required by regulation framed by the Local Government Board.

Power for Board of Agriculture to make Regulations as to Analysis of Milk, Cream, Butter, or Cheese.

4.—(1.) The Board of Agriculture may, after such inquiry as they deem necessary, make regulations for determining what deficiency in any of the normal constituents of genuine milk, cream, butter, or cheese, or what addition of extraneous matter or proportion of water, in any sample of milk (including condensed milk), cream, butter, or

cheese, shall for the purposes of the Sale of Food and Drugs Acts raise a presumption, until the contrary is proved, that the milk, cream, butter, or cheese is, not genuine or is injurious to health, and an analyst shall have regard to such regulations in certifying the result of an analysis under those Acts.

(2.) Any regulations made under this section shall be notified in the London and Edinburgh Gazettes, and shall also be made known in such other manner as the Board of Agriculture may direct.

Extension of Margarine Act, 1887, to Margarine-Cheese,
50 & 51 Vict. c. 29.

5. The provisions of the Margarine Act, 1887, as amended by this Act, shall extend to margarine-cheese, and shall apply accordingly, with the substitution of 'margarine-cheese' and 'cheese' for 'margarine' and 'butter,' and provided that all margarine-cheese sold or dealt in otherwise than by retail shall either be inclosed in packages marked in accordance with the Margarine Act, 1887, as amended by this Act, or be itself conspicuously branded with the words 'margarine-cheese.'

Marking of Margarine and Margarine-Cheese.

6.—(1.) Where under this Act or the Margarine Act, 1887, it is required that any package containing margarine or margarine-cheese shall be branded or marked, the brand or mark shall be on the package itself and not solely on a label, ticket, or other thing attached thereto.

(2.) The letters required to be printed on the paper wrapper in which margarine or margarine-cheese is sold shall be capital block letters not less than half an inch long and distinctly legible, and no other printed matter shall appear on the wrapper.

(3.) The words 'or with' in section six of the Margarine Act, 1887, shall be repealed.

Provisions as to Manufacturers of and Dealers in Margarine and Margarine-Cheese.

7.—(1.) Every occupier of a manufactory of margarine or margarine-cheese, and every wholesale dealer in such substances, shall keep a register showing the quantity and destination of each consignment of such substances sent out from his manufactory or place of business, and this register shall be open to the inspection of any officer of the Board of Agriculture.

(2.) Any officer of the Board of Agriculture shall have power to enter at all reasonable times any manufactory of margarine or margarine-cheese, and to inspect any process of manufacture therein, and to take samples for analysis.

(3.) If any such occupier or dealer—

- (a) fails to keep such a register, or
- (b) refuses to produce the register when required to do so by an officer of the Board of Agriculture, or
- (c) fails to keep the register posted up to date, or
- (d) wilfully makes any entry in the register which is false in any particular, or
- (e) fraudulently omits to enter any particular which ought to be entered in the register,

he shall be liable on summary conviction for the first offence to a fine not exceeding ten pounds, and for any subsequent offence to a fine not exceeding fifty pounds.

(4.) The provisions of section nine of the Margarine Act, 1887, relating to registration of manufactories shall extend to any premises wherein the business of a wholesale dealer in margarine or margarine-cheese is carried on.

(5.) The registration of a manufactory or other premises shall be forthwith notified by the local authority to the Board of Agriculture.

Restriction on Amount of Butter Fat in Margarine.

8. It shall be unlawful to manufacture, sell, expose for sale, or import any margarine, the fat of which contains more than ten per cent. of butter fat, and every person who manufactures, sells, exposes for sale, or imports any margarine which contains more than that percentage, shall be guilty of an offence under the Margarine Act, 1887, and any defence which would be a defence under section seven of that Act shall be a defence under this section, and the provisions of the former section shall apply accordingly.

Provided that nothing in this section shall apply to any margarine manufactured or imported in fulfilment of any contract made before the twentieth day of July one thousand eight hundred and ninety-nine.

Provision as to Name and Address of Person selling Milk or Cream in a Public Place.

9. Every person who, himself or by his servant, in any highway or place of public resort sells milk or cream from a vehicle or from a can or other receptacle shall have conspicuously inscribed on the vehicle or receptacle his name and address, and in default shall be liable on summary conviction to a fine not exceeding two pounds.

Division of Samples taken in Course of Delivery or Transit.

10. In the case of a sample taken of milk in course of delivery, or of margarine or margarine-cheese forwarded by a public conveyance, the person taking the sample shall forward by registered parcel or

otherwise a portion of the sample marked, and sealed, or fastened up, to the consignor if his name and address appear on the can or package containing the article sampled.

Provisions as to Condensed Separated or Skimmed Milk.

11. Every tin or other receptacle containing condensed separated or skimmed milk must bear a label clearly visible to the purchaser on which the words 'Machine-skimmed Milk,' or 'Skimmed Milk,' as the case may require, are printed in large and legible type, and if any person sells or exposes or offers for sale condensed separated or skimmed milk in contravention of this section he shall be liable on summary conviction to a fine not exceeding ten pounds.

Notice of Mixtures. 38 & 39 Vict. c. 63.

12. The label referred to in section eight of the Sale of Food and Drugs Act, 1875, shall not be deemed to be distinctly and legibly written or printed within the meaning of that section unless it is so written or printed that the notice of mixture given by the label is not obscured by other matter on the label: Provided that nothing in this enactment shall hinder or affect the use of any registered trade mark, or of any label which has been continuously in use for at least seven years before the commencement of this Act; but the Comptroller-General of Patents, Designs, and Trade Marks shall not register any trade mark purporting to describe a mixture unless it complies with the requirements of this enactment.

Amendment of 38 & 39 Vict. c. 63, as to Samples.

13. In section fourteen of the Sale of Food and Drugs Act, 1875, the words 'offer to' and the words 'proceed accordingly and shall' shall be repealed.

Taking Samples in Course of Delivery. 42 & 43 Vict. c. 30.

14. The provisions of section three and section four of the Sale of Food and Drugs Act Amendment Act, 1879 (relating to the taking of samples of milk in course of delivery), shall apply to every other article of food: Provided that no samples shall be taken under this section except upon the request or with the consent of the purchaser or consignee.

Amendment of 38 & 39 Vict. c. 63, as to Registered Parcels.

15. In section sixteen of the Sale of Food and Drugs Act, 1875, the words 'registered parcel' shall be substituted for the words 'registered letter.'

Obstruction of Officer in Discharge of his Duties.

16. Any person who wilfully obstructs or impedes any inspector or other officer in the course of his duties under the Sale of Food and Drugs Acts, or by any gratuity, bribe, promise, or other inducement prevents, or attempts to prevent, the due execution by such inspector or officer of his duty under those Acts, shall be liable, on summary conviction, for the first offence to a fine not exceeding twenty pounds, for the second offence to a fine not exceeding fifty pounds, and for any subsequent offence to a fine not exceeding one hundred pounds.

Penalties for Offences under the Sale of Food and Drugs Acts.

17.—(1.) Where, under any provision of the Sale of Food and Drugs Act, 1875, a person guilty of an offence is liable to a fine which may extend to twenty pounds as a maximum, he shall be liable for a second offence under the same provision to a fine not exceeding fifty pounds, and for any subsequent offence to a fine not exceeding one hundred pounds.

(2.) Where, under any provision of the Sale of Food and Drugs Acts, a person guilty of an offence is liable to a fine exceeding fifty pounds, and the offence, in the opinion of the court, was committed by the personal act, default, or culpable negligence of the person accused, that person shall be liable (if the court is of opinion that a fine will not meet the circumstances of the case) to imprisonment, with or without hard labour, for a period not exceeding three months.

Articles sold in Tins or Packets. 38 & 39 Vict. c. 63.

18. Notwithstanding anything in section seventeen of the Sale of Food and Drugs Act, 1875, where any article of food or drug is exposed for sale in an unopened tin or packet duly labelled, no person shall be required to sell it except in the unopened tin or packet in which it is contained.

Time for Proceeding, and Regulation as to Summons.

19.—(1.) When any article of food or drug has been purchased from any person for test purposes, any prosecution under the Sale of Food and Drugs Acts in respect of the sale thereof, notwithstanding anything contained in section twenty of the Sale of Food and Drugs Act, 1875, shall not be instituted after the expiration of twenty-eight days from the time of the purchase.

(2.) In any prosecution under the Sale of Food and Drugs Acts the summons shall state particulars of the offence or offences alleged, and also the name of the prosecutor, and shall not be made returnable in less time than fourteen days from the day on which it is served, and there must be served therewith a copy of any analyst's certificate obtained on behalf of the prosecutor.

*Provisions as to Use of Warranty or Invoice as Defence, and
Proceedings against the Warrantor.*

20.—(1.) A warranty or invoice shall not be available as a defence to any proceeding under the Sale of Food and Drugs Acts unless the defendant has, within seven days after service of the summons, sent to the purchaser a copy of such warranty or invoice with a written notice stating that he intends to rely on the warranty or invoice, and specifying the name and address of the person from whom he received it, and has also sent a like notice of his intention to such person.

(2.) The person by whom such warranty or invoice is alleged to have been given shall be entitled to appear at the hearing and to give evidence, and the court may, if it thinks fit, adjourn the hearing to enable him to do so.

(3.) A warranty or invoice given by a person resident outside the United Kingdom shall not be available as a defence to any proceeding under the Sale of Food and Drugs Acts, unless the defendant proves that he had taken reasonable steps to ascertain and did in fact believe in the accuracy of the statement contained in the warranty or invoice.

(4.) Where the defendant is a servant of the person who purchased the article under a warranty or invoice he shall, subject to the provisions of this section, be entitled to rely on section twenty-five of the Sale of Food and Drugs Act, 1875, and section seven of the Margarine Act, 1887, in the same way as his employer or master would have been entitled to do if he had been the defendant, provided that the servant further proves that he had no reason to believe that the article was otherwise than that demanded by the prosecutor.

(5.) Where the defendant in a prosecution under the Sale of Food and Drugs Acts has been discharged under the provisions of section twenty-five of the Sale of Food and Drugs Act, 1875, as amended by this Act, any proceedings under the Sale of Food and Drugs Acts for giving the warranty relied on by the defendant in such prosecution, may be taken as well before a court having jurisdiction in the place where the article of food or drug to which the warranty relates was purchased for analysis as before a court having jurisdiction in the place where the warranty was given.

(6.) Every person who, in respect of an article of food or drug sold by him as principal or agent, gives to the purchaser a false warranty in writing, shall be liable on summary conviction, for the first offence, to a fine not exceeding twenty pounds, for the second offence to a fine not exceeding fifty pounds, and for any subsequent offence to a fine not exceeding one hundred pounds, unless he proves to the satisfaction of the court that when he gave the warranty he had reason to believe that the statements or descriptions contained therein were true.

Duty of Court to send Article for Analysis. 38 & 39 Vict. c. 63.

21. The justices or court referred to in section twenty-two of the Sale of Food and Drugs Act, 1875, shall on the request of either party under that section cause an article of food or drug to be sent to the Commissioners of Inland Revenue for analysis, and may, if they think fit, do so without any such request.

Provisions as to Certificates of Analysis.

22.—(1.) At the hearing of the information in any proceeding under the Sale of Food and Drugs Acts, the production by the defendant of a certificate of analysis by a public analyst in the form prescribed in section eighteen of the Sale of Food and Drugs Act, 1875, shall be sufficient evidence of the facts therein stated, unless the prosecutor requires that the analyst be called as a witness.

(2.) A copy of every such certificate shall be sent to the prosecutor at least three clear days before the return day, and if it be not so sent the court may, if it thinks fit, adjourn the hearing on such terms as may seem proper.

Transfer of Powers from Secretary for Scotland to Local Government Board.

23. This Act shall apply to Scotland with the substitution for 'the Local Government Board' of 'the Local Government Board for Scotland,' and all powers and duties vested in or imposed on the Secretary for Scotland in relation to the Sale of Food and Drugs Acts shall be transferred to, vested in, or imposed on the Local Government Board for Scotland.

Application to Ireland.

24. This Act shall apply to Ireland with the substitution for 'the Board of Agriculture' of 'the Department of Agriculture and Technical Instruction for Ireland,' and for 'the Local Government Board' of 'the Local Government Board for Ireland,' and for 'the London and Edinburgh Gazettes' of 'the Dublin Gazette.'

Interpretation of Terms.

25. In this Act, unless the context otherwise requires—

The expression 'margarine-cheese' means any substance, whether compound or otherwise, which is prepared in imitation of cheese, and which contains fat not derived from milk :

The expression 'cheese' means the substance usually known as cheese, containing no fat derived otherwise than from milk :

The expression 'local authority' means any local authority authorised to appoint an analyst for the purposes of the Sale of Food and Drugs Acts, and the expression 'public analyst' means an analyst so appointed.

Other expressions have the same meaning as in the Sale of Food and Drugs Acts, and an offence under this Act shall be treated as an offence under those Acts.

Definition of 'Food.'

26. For the purposes of the Sale of Food and Drugs Acts the expression 'food' shall include every article used for food or drink by man, other than drugs or water, and any article which ordinarily enters into or is used in the composition or preparation of human food; and shall also include flavouring matters and condiments.

Repeal of Enactments in Schedule.

27. The enactments in the schedule to this Act are hereby repealed to the extent mentioned in the third column of that schedule.

Short Title and Commencement.

28.—(1.) This Act may be cited as the Sale of Food and Drugs Act, 1899, and the Sale of Food and Drugs Act, 1875, and the Sale of Food and Drugs Act Amendment Act, 1879, and the Margarine Act, 1887, and this Act may be cited collectively as the Sale of Food and Drugs Acts, 1875 to 1899, and are in this Act referred to as the Sale of Food and Drugs Acts.

(2.) This Act shall come into operation on the first day of January one thousand nine hundred.

SCHEDULE.

ENACTMENTS REPEALED.

Session and Chapter.	Short Title.	Extent of Repeal.
38 & 39 Vict. c. 63.	The Sale of Food and Drugs Act, 1875.	In section two, the definition of the term 'food.' In section fourteen, the words 'offer to,' and the words 'proceed accordingly and shall.' Section fifteen. In section twenty-seven, the words from 'Every person who shall give a false warranty in writing,' to 'a penalty not exceeding twenty pounds.'
42 & 43 Vict. c. 30.	The Sale of Food and Drugs Act Amendment Act, 1879.	Section ten.
50 & 51 Vict. c. 29.	The Margarine Act, 1887.	In section six, the words 'or with,' and the words 'not less than a quarter of an inch square.'
54 & 55 Vict. c. 46.	The Post Office Act, 1891.	Section eleven.

**METROPOLIS LOCAL MANAGEMENT ACTS
AMENDMENT.**

91. No person within any parish mentioned in Schedule A to the firstly recited Act, or in any district mentioned in Schedule B to the said Act, shall breed, feed, or keep any swine in any locality, premises, or place which may be unfit for the keeping of swine, or in which the breeding, feeding, or keeping of swine may create a nuisance, or be injurious to health; and any person breeding, feeding, or keeping swine in or on any such locality, premises, or place shall be liable to a penalty not exceeding forty shillings, and to a further penalty not exceeding ten shillings for every day during which he shall continue such offence after notice from the vestry or district board to discontinue the same, and any such penalty may be recovered by a summary proceeding; and if in any proceeding under this enactment it shall be proved to the satisfaction of the justice or justices that any such locality, premises, or place are or is unfit for the keeping of swine, such justice or justices may prohibit the using thereof for that purpose for the future; and any person disobeying the order of any justice or justices in this behalf shall be liable to a penalty of ten shillings for every day during such his default.

92. The one hundred and thirty-first section of the firstly recited Act, and the thirty-fifth section of The Metropolitan Market Act, 1857 (twentieth and twenty-first Victoria, chapter one hundred and thirty-five) (Local and Personal), are repealed; but all licences granted in pursuance of the provisions in the said repealed sections contained shall continue in force for the space of one year next after the day of the granting of the same respectively, and all offences heretofore committed against the provisions of the said Acts, or either of them, in relation to slaughter-houses, shall be dealt with in every respect as if this Act had not been passed.

93. From and after the first day of November, one thousand eight hundred and sixty-two, no place within any parish or place mentioned in the schedules to the firstly recited Act shall be used by any person carrying on the business of a slaughterer of cattle or cow-keeper or dairyman as a slaughter-house for the purpose of slaughtering cattle or a cow-house or place for the keeping of cows, without a licence had for such purpose respectively from the justices of the peace assembled at a special sessions held in the division or district where such slaughter-house, cow-house, or place is situate, and such licence shall continue in force for the period of one year from the granting thereof, and thenceforth until the special sessions to be held next after the expiration of such period, and no fee or reward exceeding five shillings shall be taken for any such licence; and if any person carrying on such business of a slaughterer of cattle, cow-keeper, or dairyman use

as a slaughter-house or cow-house any place within any parish or place mentioned in the schedules of the firstly recited Act which is not so licensed, every person so offending shall for each offence be liable to a penalty not exceeding five pounds, of which offence the fact that cattle have been taken into such place shall be deemed sufficient *prima facie* evidence : provided always, that before any licence for the use of any place as a slaughter-house or cow-house is granted as aforesaid, fourteen days' notice of the intention to apply for such licence shall be given to the vestry or district board of the parish or district in which any such place is situate, to the intent that such vestry or district board, if they think fit, may show cause against the granting of any such licence, and also seven days' notice previous to such special sessions being held of the intention to apply for such licence shall be given to the clerk of the justices for such division : provided that nothing in this Act contained shall extend to slaughter-houses erected or to be erected in the Metropolitan Cattle Market under the authority of the Metropolitan Market Act, 1851, or the Metropolitan Market Act, 1857.

94. Before any licence for the keeping or using of any house or place within the Metropolitan police district as a licensed slaughtering-house or place for the purpose of slaughtering or killing horses or other cattle not killed for butcher's meat shall be granted by any quarter sessions of the peace under the provisions of the Act of the session holden in the twenty-sixth year of the reign of His Majesty King George the Third, chapter seventy-one, or of the Act of the session holden in the seventh and eighth years of Her present Majesty, chapter eighty-seven, or any Act amending either of the said Acts, one month's previous notice of the intention to apply for such licence shall be given to the vestry or district board of the parish or district in which such house or place is situate, to the intent that such vestry or district board, if they think fit, may show cause against the grant of such licence.

95. It shall be lawful for every vestry and district board, if they in their discretion think fit, to appoint and employ a sufficient number of persons, or to contract with any company or persons, for collecting and removing the manure and refuse straw from such stables and cow-houses within their parish or district, the occupiers of which may signify their consent in writing to such removal : provided that such consent shall not be withdrawn or revoked without one month's previous notice to the vestry or district board, and that no person shall be hereby relieved from any penalty or penalties to which they may be subject for placing dung or manure upon the footways or carriageways of any parish or district, or for having any accumulation or deposit of manure so as to be a nuisance or injurious to health.

PUBLIC HEALTH (SCOTLAND) ACT, 1897.

LICENSING OF SLAUGHTER-HOUSES.

Section 33.—A person carrying on the business of a slaughterer of cattle or horses, or knacker, shall not use any premises as a slaughter-house or knacker's yard without a licence from the local authority, and if he does, he shall for each offence be liable to a penalty not exceeding five pounds, and the fact that cattle or horses have been taken into unlicensed premises shall be *prima facie* evidence that an offence under this section has been committed.

[2] A licence under this section shall expire on such day in every year as the local authority fix, and when a licence is first granted, shall expire on the day so fixed which secondly occurs after the grant of the licence, and a fee not exceeding five shillings may be charged for the licence or any renewal thereof.

[3] Not less than twenty-one days before a new licence for any premises is granted under this section notice of the intention to apply for it shall be advertised as provided in subsection 2 of the immediately preceding section by the local authority of the district in which the premises are situate, and any person interested may show cause against the grant or renewal of the licence.

[4] An objection shall not be entertained to the renewal of a licence under this section, unless seven days' previous notice of the objection has been served on the applicant, save that, on an objection being made of which notice has not been given, the local authority may, if they think it is just to do so, direct notice thereof to be served on the applicant, and adjourn the question of the renewal to a future day, and require the attendance of the applicant on that day, and then hear the case, and consider the objection, as if the said notice had been duly given.

[6] The local authority shall have right to enter any slaughter-house or knacker's yard at any hour by day, or at any hour when business is in progress, or is usually carried on therein, for the purpose of examining whether there is any contravention therein of this Act or of any by-law made thereunder.

[7] Where any person carrying on the business of a slaughterer of cattle or horses or knacker at the passing of this Act is refused by the local authority a licence for the premises where such business is carried on, or where any person has been refused a renewal of any licence, such person may appeal to the board against such refusal, and the decision of the board shall be final; but in the case of a district other than a burgh the appeal to the board shall only arise after the county council has given its determination on the matter, and a local authority may appeal to the board against the determination of the county council.

LOCAL AUTHORITIES MAY PROVIDE A SLAUGHTER-HOUSE.

Section 34.—The local authority of any district *other than* a burgh may provide, establish, improve, or extend and maintain within or without their district, and two or more such local authorities may combine to so provide, establish, improve, or extend and maintain fit shambles or slaughter-houses for the purpose of slaughtering cattle, and for that purpose may borrow such sums of money as they shall find necessary on the security of the public health assessment, and of the rates to be taken and levied for the use of such shambles or slaughter-houses and ground on which the same are erected, or on any one or more thereof, and the provisions of Section 141 of this Act shall, with the necessary modifications, apply to such borrowing.

[It will be observed by the student reading the Public Health (Scotland) Act, 1897, that the terms 'slaughterer of cattle' and 'knacker' come under the category of 'Offensive Trades' (Section 32). Under this section it is enacted that no offensive trade can be established without the sanction of the local authority, and the local authority shall give fourteen days' clear notice of their intention to give sanction. Under Section 33 it is necessary to give twenty-one days' notice of the intention to seek a licence for a slaughter-house or knackery. It may be taken for granted that when dealing with licences for the latter the period specified in Section 33 will be that followed.]

UN SOUND FOOD.

Section 43.—Any medical officer or sanitary inspector, or any veterinary surgeon approved for the purposes of this section by the local authority, may at all reasonable times enter any premises within the district of the local authority, or search any cart or vehicle, or any barrow, basket, sack, bag, or parcel, in order to inspect or examine, and may inspect and examine—

- (a) Any animal, alive or dead, intended for the food of man which is exposed for sale, or is in course of transmission for the purpose of sale or of preparation for sale ; and
- (b) Any article, whether solid or liquid, intended for the food of man, and sold or exposed for sale, or deposited in any place or in course of transmission for the purpose of sale or of preparation for sale ;

the proof that the same was not exposed or deposited, or in course of transmission for any such purpose, or was not intended for the food of man, resting with the person charged ; and if any such animal or article appears to such medical officer or sanitary inspector or veterinary surgeon to be diseased, or unsound, or unfit for the food of man, he may seize and carry away the same himself or by any assistant, in

order to have the same dealt with summarily by a sheriff, magistrate, or justice.

Provided that in the case of any proceeding under this section with regard to a living animal the medical officer or sanitary inspector, unless he is himself a qualified veterinary surgeon, shall be accompanied by a veterinary surgeon approved as aforesaid.

The police force of each police area shall have power to search carts or vehicles, or barrows, baskets, sacks, bags, or parcels, and to assist generally in executing and enforcing this section.

[2] If it appears to a sheriff, magistrate, or justice that any animal or article which has been seized, or is liable to be seized, under this section is diseased, or unsound, or unfit for the food of man, he shall condemn the same, and order it to be destroyed or so disposed of as to prevent it from being exposed for sale or used for the food of man; and the person to whom the same belongs, or did belong, at the time of sale or exposure for sale, or deposit, or transmission for the purpose of sale, or of preparation for sale, or in whose possession or on whose premises the same was found, shall be liable to a penalty not exceeding fifty pounds for every animal or article, or if the article consists of fruit, vegetables, corn, bread, or flour, for every parcel thereof so condemned, unless he proves that he and the person acting on his behalf (if any) did not know, and could not with reasonable care have known, that it was in such condition, or where the proceedings are before a sheriff, at the discretion of the court, if it finds that he knowingly and wilfully committed the offence, he shall be liable, without the infliction of a penalty, to imprisonment for a term of not more than three months, with or without hard labour, and also to pay all expenses caused by the seizure, detention, or disposal thereof.

Provided that if such person proves that the animal, or part thereof, condemned as aforesaid was within a reasonable time prior to the seizure thereof examined upon the premises where the animal was slaughtered, and passed by a veterinary surgeon approved as aforesaid, called in for the purpose, and who shall have granted a certificate of passing as nearly as may be as in the next subsection provided, or by a veterinary surgeon in terms of that subsection, he shall be exempt from penalty or imprisonment under this section for such offence.

[3] Each local authority, or two or more local authorities in combination, may, if they think fit, appoint a place or places within its district or their districts, and fix a time or times at which a veterinary surgeon, approved as aforesaid, shall attend for the purpose of examining any animal alive or dead which may there be submitted to him, and passing or condemning the same, and such veterinary surgeon shall, on receipt of a fee to be fixed by the local authority or authorities, and paid by the owner, examine and pass or condemn in whole or in part any animal or carcass so

submitted to him; and if he shall pass the same, he shall grant a certificate of passing, which shall set forth the name of the owner, the date and hour of examination, and such particulars regarding the animal or carcass as the local authority or authorities may prescribe for the purpose of aiding in the subsequent identification of the same; and if he shall condemn the animal or carcass, or part thereof, the animal or carcass, or part so condemned, shall be retained and be forthwith destroyed by the local authority or authorities, or so disposed of as to prevent it from being exposed for sale or used for the food of man, and the owner shall be entitled to the net price realized from the residual product of the carcass or part so condemned, if any, after deducting the expense of condemnation and destruction. Provided that no carcass shall be submitted for examination, either under this or the immediately preceding subsection, unless as a whole carcass, including the thoracic and abdominal viscera, in such manner that the examiner shall be readily able to satisfy himself that the organs are those of the carcass under inspection.

[4] Where it is shown that any animal or article liable to be seized under this section, and found in the possession of any person, was purchased by him, or consigned to him, from another person for the food of man, and when so purchased or consigned was in such a condition as to be liable to be seized and condemned under this section, the person who so sold or consigned the same shall be liable to be brought to trial in the district in which such animal or article was seized, and on conviction shall be liable to the penalty and imprisonment above mentioned, unless he proves that, at the time he sold or consigned the said animal or article, he and the person acting on his behalf, if any, did not know, and could not with reasonable care have known, that it was in such a condition.

[5] A copy of any certificate granted by a veterinary surgeon, under subsections 2 or 3 or this section, shall forthwith be sent by him to the chief constable of the jurisdiction in which the examination of the animal or carcass took place, and the certificate itself shall be sent by the person selling the animal or carcass forthwith after the sale, and not more than seven days from the date of the certificate to the chief constable of the jurisdiction in which the sale of the animal or carcass took place, and if any veterinary surgeon or person shall contravene this enactment, he shall be liable to a penalty not exceeding twenty pounds.

[6] Where any person convicted of an offence under this section has been within twelve months previously convicted of an offence under this section, the sheriff, magistrate, or justice may, if he thinks fit, and finds that the offender knowingly and wilfully committed both such offences, order that a notice of the facts be affixed, in such form and manner and for such period not exceeding twenty-one days, as

the sheriff, magistrate, or justice may order, to any premises occupied by that person, and that the person do pay the costs of such affixing; and if any person obstructs the affixing of such notice, or removes, defaces, or conceals the notice while affixed during the said period, he shall for each offence be liable to a penalty not exceeding five pounds.

[7] If the occupier of a licensed slaughter-house is convicted of an offence under this section, the sheriff, magistrate, or justice convicting him may cancel the licence for such slaughter-house.

[8] If any person obstructs a medical officer, sanitary inspector, or veterinary surgeon as aforesaid in the performance of his duty under this section, he shall, where the proceedings are before a sheriff, and where the sheriff is satisfied that the obstruction was with intent to prevent the discovery of an offence under this section, or that the accused has within twelve months previously been convicted of such obstruction, be liable to imprisonment for any term not exceeding one month in lieu of any penalty authorized by this Act for such obstruction.

[9] A sheriff, magistrate, or justice may act in adjudicating on an offender under this section, whether he has or has not acted in ordering the animal or article to be destroyed or disposed of.

BURGH POLICE (SCOTLAND) ACT.

SLAUGHTER-HOUSES.

Sections 278-287.—278 (as amended by the Burgh Police (Scotland) Act, 1903). The Commissioners may provide, establish, improve, or extend, within or without the burgh, fit shambles or slaughter-houses for the purpose of slaughtering cattle, and for that purpose may borrow such sums of money as they shall find necessary, on the security of the burgh general assessment, and of the rates to be taken and levied for the use of such shambles and slaughter houses, and of the shambles or slaughter-houses and ground on which the same are erected, or on any one or more thereof, provided that any town council which is refused by a local authority a licence under Section 33 of the Public Health (Scotland) Act, 1897, for premises for a slaughter-house without the burgh may appeal to the Local Government Board for Scotland against such refusal, and the decision of the Board shall be final.

And where in any burgh the Commissioners, or their predecessors in office, shall have provided and established such shambles or slaughter-houses, and shall have paid for that purpose moneys out of the police or other funds under their charge, the Commissioners may

repay such moneys out of the burgh general assessment, or out of any moneys borrowed on the security thereof, or in so far as the moneys so paid exceed in amount the moneys borrowed for the purposes of such shambles or slaughter-houses, under the powers of any special Act or provisional order, and may for the purpose of such repayment borrow money on the security of the burgh general assessment; and they may also apply any funds under their charge towards the maintenance and management of such shambles or slaughter-houses, and the payment of any feu duties or any other annual burdens affecting the same, in the event of the rates levied for the use thereof not being sufficient for those purposes.

280 (as amended by the Burgh Police (Scotland) Act, 1903). The medical officer of health of the burgh shall report to the Commissioners on the sanitary condition of all slaughter-houses belonging to or licensed under the Public Health (Scotland) Act, 1897, by the Commissioners at least twice every year, and he, as well as the sanitary inspector, and any other person who may be specially appointed by the Commissioners for the purpose, shall have right of access to such slaughter-houses at all reasonable times for the purpose of inspecting the same.

281 (as amended by the Burgh Police (Scotland) Act, 1903). The Commissioners shall from time to time make by-laws, to be confirmed in the manner herein provided, for the registering, regulation, and inspection of slaughter-houses, and preventing cruelty in slaughter-houses, and for keeping the same in a cleanly and proper state, and for removing filth at least once in every twenty-four hours, and for having them properly floored, drained, and provided with a sufficient supply of water, and they may impose pecuniary penalties on persons breaking such by-laws; provided that no such penalty exceed for any one offence the sum of five pounds, and in the case of a continuous violation of such by-laws, the sum of ten shillings for every day during which such nuisance shall be continued after the conviction of the first offence.

282 (as amended by the Burgh Police (Scotland) Act, 1903). The magistrate before whom any person is convicted of killing or dressing any cattle contrary to the provisions of this Act, or of the said by-laws, in addition to the penalty imposed, may suspend for any period not exceeding two months the licence granted under the Public Health (Scotland) Act, 1897, to such person; and such magistrate, upon the conviction of any person for a second or other subsequent like offence, may, in addition to the penalty imposed, declare the licence granted to be revoked.

283. Every person who, during the period for which any such licence is suspended, or after the same is revoked as aforesaid, slaughters cattle in the slaughter-house to which such licence relates,

or otherwise uses such slaughter-house, or allows the same to be used as a slaughter-house, shall be liable to a penalty not exceeding five pounds for such offence, and a further penalty of five pounds for every day on which any such offence is committed after the conviction for the first offence.

284 (as amended by the Burgh Police (Scotland) Act, 1903). If the Commissioners have provided under any former Act, or resolve to provide and establish, and do provide and establish, shambles or slaughter-houses, as herein provided, no person shall thereafter slaughter any cattle or beasts, or scald or dress the carcasses of any slaughtered cattle, or cause the same to be done, within the boundaries of the burgh, elsewhere than within the said slaughter-houses, under a penalty of five pounds for each offence; provided always that this enactment shall not apply to any owner or occupier within the burgh who may keep any cattle or beasts within the burgh, and who may kill the same for his own or family consumption, and it shall be lawful for the Commissioners to charge, for the use of the said slaughter-houses, such reasonable rate or sum, having regard to the cost of construction, maintenance, and working thereof, as may be agreed on between them and the persons using the same; and in case of difference as to the rate to be taken for the use of such slaughter-houses, the same shall, upon the application of either party, and after seven days' previous notice to the other party of such intended application, be fixed by the Sheriff in a summary manner, and the decision of the Sheriff shall be final.

And to prevent evasion of the use of such slaughter-houses, all persons who shall, after such slaughter-houses are provided, bring within the boundaries of the burgh, for sale or consumption therein, the carcass, or part of a carcass, of any cattle or beast slaughtered within the distance of two miles beyond such boundaries elsewhere than in slaughter-houses provided or duly licensed in pursuance of any Act of Parliament shall, on bringing such carcass, or part of a carcass, within the said boundaries, be liable in payment to the Commissioners of the amount of the rates or sums then being levied for cattle or beasts slaughtered in such slaughter-houses provided by them; provided that where, before the passing of this Act, or within one year thereafter, any burgh shall have erected slaughter-houses, no other slaughter-house shall be erected within the distance of two miles from the existing boundaries of such burgh, unless either it is erected with the consent of the Commissioners of such burgh, or is situated within the area of another burgh, or is provided by a local authority other than a town council, and in such last mentioned case, notice of the proposal to provide a slaughter-house shall be given by such local authority to the town council of the burgh, and the town council may within one month after receipt of such notice appeal to the Local

Government Board for Scotland against such proposal, and the decision of the Board shall be final.

285 (as amended by the Burgh Police (Scotland) Act, 1903). It shall not be lawful to use any place within the burgh as a place of deposit for the carcasses of horses, unless and until every such place is licensed by the Commissioners, who are hereby authorized to give and recall such licences at pleasure; and it shall not be lawful to carry or convey within the burgh any dead horse unless in a covered cart or waggon, or unless the dead carcass be sufficiently covered; and any person who shall offend against this enactment shall be liable to a penalty not exceeding ten pounds, and a further penalty not exceeding two pounds for every day on which such offence shall continue.

286. Nothing in or done under this Act shall interfere with the operation or effect of the Contagious Diseases (Animals) Acts, 1878 to 1890, or of any order, licence, or act of the Board of Agriculture made, granted, or done, or to be made, granted or done thereunder, or of any order, regulation, licence, or act of a local authority made, granted, or done, or to be made, granted, or done, under any such order of the Board of Agriculture, or prohibit or interfere with the slaughter of any animals in accordance with the provisions of the said Act, or of any such order, licence, or regulation.

287. The provisions of the Cattle-sheds in Burgh (Scotland) Act, 1866, or Acts amending the same, may be carried into effect and enforced in the burgh by the magistrates, and offences against the same may be tried by the magistrates as police offences, and the penalties may be recovered and applied in the same way as penalties for police offences under this Act.

PUBLIC HEALTH (IRELAND) ACT, 1878.

UN SOUND MEAT, ETC.

Sections 132-136.—Any sanitary officer of the sanitary authority may at all reasonable times inspect and examine any animal, carcass, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, milk, or butter exposed or being conveyed for sale, or deposited in any place for the purpose of sale, or of preparation for sale, and intended for the food of man, the proof that the same was not exposed or being conveyed or deposited for any such purpose, or was not intended for the food of man, resting with the party charged; and if any such animal, carcass, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, milk, or butter, appears to such sanitary officer to be diseased, or unsound, or unwholesome, or unfit for the food of man, he may seize and carry away the same himself, or by an assistant, in order to have the same dealt with by a justice; and should he seize

the same in a public thoroughfare, may require the person conveying the same to give his own name and address and that of the owner of the article seized, and in default, or if the officer have reasonable ground for suspecting the names or addresses so given to be false, may detain such person and give him into custody until his real name and address be ascertained. Any person giving a false name or address to any officer authorized to demand the same under this section shall be liable to a penalty not exceeding five pounds.

133. If it appears to the justice that any animal, carcass, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, milk, or butter so seized is diseased, or unsound, or unwholesome, or unfit for the food of man, he shall condemn the same, and order it to be destroyed or so disposed of as to prevent it from being exposed for sale or used for the food of man; and the person to whom the same belongs, or did belong at the time of exposure or conveyance for sale, or in whose possession or on whose premises the same was found, shall be liable to a penalty not exceeding twenty pounds for every animal, carcass, or fish, or piece of meat, flesh, or fish, or any poultry or game, or for the parcel of fruit, vegetables, corn, bread, or flour, or for the milk or butter so condemned, or at the discretion of the justice, without the infliction of a fine, to imprisonment for a term of not more than three months.

The justice who, under this section, is empowered to convict the offender may be either the justice who may have ordered the article to be disposed of or destroyed, or any other justice having jurisdiction in the place.

134. Any person who in any manner prevents any sanitary officer or other person duly authorized by the sanitary authority of the sanitary district from entering any premises in such district and inspecting any animal, carcass, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, milk, or butter, exposed or deposited for the purpose of sale, or of preparation for sale, and intended for the food of man, or who obstructs or impedes any such officer or person, when carrying into execution the provisions of this Act, shall be liable to a penalty not exceeding five pounds.

135. On complaint made on oath by a sanitary officer, or other person duly authorized by a sanitary authority, any justice may grant a warrant to any such officer or person to enter any building, or part of a building, in which such officer or person has reason for believing that there is kept or concealed any animal, carcass, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, milk, or butter which is intended for sale for the food of man, and is diseased, unsound, or unwholesome, or unfit for the food of man; and to search for, seize, and carry away any such animal or other article in order to have the same dealt with by a justice under the provisions of this Act.

Any person who obstructs any such officer or person in the performance of his duty under such warrant shall, in addition to any other punishment to which he may be subject, be liable to a penalty not exceeding twenty pounds.

136. The grand jury of any county may, for the purpose of providing for the due execution of the Sale of Food and Drugs Act, 1875, from time to time, without previous application to presentment sessions, present in advance such moneys as may in their opinion be necessary, and the treasurer, or any person discharging the duties of treasurer, or finance committee of such county may, out of any money in his or their hands raised in pursuance of any such presentment, from time or time advance to any inspector of weights and measures or police constable such sums as he or they may think necessary for the purpose aforesaid.

MARKETS AND SLAUGHTER-HOUSES.

Sections 103-106.—Any urban authority shall have power, at a meeting specially convened for the purpose, of which not less than thirty days' public notice has been given, and at which not less than two-thirds of the members are present, and so that a clear majority of the entire body concurs, and that the Local Government Board approves, to do the following things, or any of them, within their district :

To provide a market-place and construct a market-house and other conveniences for the purpose of holding markets ;

To provide houses and places for weighing carts ;

To make convenient approaches to such market ;

To provide all such matters and things as may be necessary for the convenient use of such market ;

To purchase or take on lease or otherwise land or the right to use land, and public or private rights in markets and tolls for any of the foregoing purposes ;

To take stallages, rents, and tolls in respect of the use by any person of such market ;

but no market shall be established in pursuance of this section so as to interfere with any rights, powers, or privileges enjoyed within the district by any person without his consent.

For the purpose of enabling any urban authority to establish or to regulate markets, there shall be incorporated with this Act the provisions of the Markets and Fairs Clauses Act, 1847, in so far as the same relate to markets—that is to say :

With respect to the holding of the market or fair, and the protection thereof ; and

With respect to the weighing goods and carts ; and

With respect to the stallages, rents, and tolls ;

provided that all tolls leviable by an urban authority in pursuance of this section shall be approved by the Local Government Board.

An urban authority may with respect to any market belonging to them make by-laws for any of the purposes mentioned in Section 42 of the Markets and Fairs Clauses Act, 1847, so far as those purposes relate to markets, and printed copies of any by-law so made shall be conspicuously exhibited in the market.

104. Any urban authority may purchase, and the directors of any market company, in pursuance, in the case of a company registered under the Companies Act, 1862, of a special resolution of the members passed in manner provided by that Act, and in the case of any other company, of a resolution passed by a majority of three-fourths in number and value of the members present, either personally or by proxy, at a meeting specially convened with notice of the business to be transacted, may sell and transfer to any urban authority, on such terms as may be agreed on between the company and the urban authority, all the rights, powers, and privileges, and all or any of the markets, premises, and things which at the time of such purchase are the property of the company, but subject to all liabilities attached to the same at the time of such purchase.

105. Any urban authority may, if they think fit, provide slaughter-houses, and they shall make by-laws with respect to the management and charges for the use of any slaughter-houses so provided.

For the purpose of enabling any urban authority to regulate slaughter-houses within their district the provisions of the Towns Improvement Clauses Act, 1847, with respect to slaughter-houses shall be incorporated with this Act.

Nothing in this section shall prejudice or affect any rights, powers, or privileges of any persons incorporated by any local Act in force at the time of the passing of this Act for the purpose of making and maintaining slaughter-houses.

Any urban authority may make by-laws for the decent and seemly conveyance of meat through the public thoroughfares.

106. The owner or occupier of any slaughter-house licensed or registered under this Act shall, within one month after the licensing or registration of the premises, affix, and shall keep undefaced and legible on some conspicuous place on the premises, a notice with the words 'Licensed Slaughter-house,' or 'Registered Slaughter-house,' as the case may be.

Any person who makes default in this respect, or who neglects or refuses to affix or renew such notice after requisition in writing from the urban authority, shall be liable to a penalty not exceeding five pounds for every such offence, and of ten shillings for every day during which such offence continues after conviction.

ANTHRAX ORDER, 1910.

(7989.)

ORDER OF THE BOARD OF AGRICULTURE AND FISHERIES.

(DATED 24TH SEPTEMBER, 1910.)

ANTHRAX ORDER OF 1910.

The Board of Agriculture and Fisheries, by virtue and in exercise of the powers vested in them under the Diseases of Animals Acts, 1894 to 1910, and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows :

Interpretation.

1. In this Order, unless the context otherwise requires,—

‘The Board’ means the Board of Agriculture and Fisheries :

‘The Act of 1894’ means the Diseases of Animals Act, 1894 :

‘Animals’ means cattle, sheep, and goats, and all other ruminating animals, and swine, horses, asses, mules and dogs :

‘Disease’ means anthrax, and ‘diseased’ or ‘suspected’ means affected with or suspected of anthrax :

‘Inspector’ includes Veterinary Inspector :

‘Veterinary Surgeon’ includes any veterinary practitioner qualified to be a Veterinary Inspector according to the Act of 1894 and any Order made thereunder :

‘Carcase’ means the carcase of an animal, and includes part of a carcase, and the meat, flesh, bones, hide, skin, hoofs, horns, offal, or other part of an animal, separately or otherwise, or any portion thereof :

Other terms have the same meaning as in the Act of 1894.

Notice of Disease.

2.—(1.) Every person having in his possession or under his charge a diseased or suspected animal or carcase shall with all practicable speed give notice of the fact to a constable of the police force for the area wherein the animal or carcase is.

(2.) The constable shall forthwith give information of the receipt of the notice to an Inspector of the Local Authority, who shall forthwith report the same to the Local Authority.

(3.) The Inspector of the Local Authority shall forthwith give information of the receipt of the notice to the Medical Officer of Health of the Sanitary District in which the diseased or suspected animal or carcase is.

Precautions by Occupier in Case of Suspected Anthrax.

3.—(1.) The occupier of any premises on which there is a diseased or suspected animal or carcase shall—

- (i.) prevent access of animals or fowls to the diseased or suspected animal or carcase, or to any part of the premises which has been exposed to infection of disease from the animal or carcase ; and
- (ii.) detain on the premises any diseased or suspected animal thereon and any other head of cattle, or sheep, or goat, or swine which has been in the same shed, stable, building, yard or field with the diseased or suspected animal or carcase

until it is certified under this Order that the animal or carcase was not diseased, or a Notice (Form A) is served on the occupier of the premises under Article 7 of this Order.

(2.) The occupier shall also disinfect as soon as possible with chloride of lime any place where the carcase of a diseased or suspected animal has lain or where its blood has escaped.

Duty of Inspector to act immediately.

4.—(1.) An Inspector of a Local Authority on receiving in any manner whatsoever information of the supposed existence of anthrax in any animal or carcase, or having reasonable ground to suspect the existence of anthrax, shall proceed with all practicable speed to the place where such disease exists, or is suspected to exist, and shall there and elsewhere put in force and discharge the powers and duties conferred and imposed on him as Inspector by or under the Act of 1894 and this Order.

(2.) The Inspector shall forthwith serve a Notice (in the Form C set forth in the First Schedule hereto or to the like effect) on the occupier of any premises on which there is a diseased or suspected animal or carcase.

Veterinary Inquiry as to Existence of Anthrax.

5.—(1.) A Local Authority on receiving information of the existence, or suspected existence, of anthrax in any animal or carcase shall forthwith cause inquiry to be instituted by a veterinary surgeon as to the correctness of such information.

(2.) The owner and occupier of any premises on which there is a diseased or suspected animal or carcase, shall give all reasonable facilities for the inquiry by the Local Authority under this Article, and any person failing to give such facilities shall be deemed guilty of an offence against the Act of 1894.

(3.) If the veterinary surgeon is satisfied at the time of his examination of the animal or carcase, by a microscopical examination of its blood on the spot or by other evidence, that the animal or carcase was not diseased, he shall forthwith give to the Local Authority a certificate

to that effect, and the Local Authority shall, as soon as practicable, cause a Notice (in the Form D set forth in the First Schedule hereto or to the like effect) to be served on the occupier of the premises on which the animal or carcase was.

(4.) If the veterinary surgeon is not so satisfied he shall forthwith give to the Local Authority a certificate stating that the case is one of suspected anthrax. He shall also for the purpose of further investigation take and examine one or more samples of the blood or other fluid of the animal or carcase, or of the tissue of the carcase, as may be necessary for that purpose, and as soon as may be after examination thereof forward to the Laboratory of the Board, Alperton Lodge, Wembley, Middlesex, such samples as may be required to enable a Veterinary Inspector of the Board to certify whether or not the animal or carcase was diseased, together with a report of his examination of the animal or carcase and of his further investigation.

Precautions by Local Authority in Case of Suspected Anthrax.

6. Where the veterinary surgeon gives to the Local Authority a certificate that the case is one of suspected anthrax the Local Authority shall forthwith direct an Inspector to carry out such disinfection as the Inspector may think necessary; and in the case of a carcase shall forthwith cause the same to be destroyed in the manner prescribed by this Order.

Procedure consequent on Examination by Veterinary Inspector of the Board.

7.—(1.) Where a Veterinary Inspector of the Board certifies that an animal or carcase was diseased, the Local Authority on receipt of the certificate shall forthwith cause a Notice (in the Form A set forth in the First Schedule to this Order or to the like effect) to be served by an Inspector on the occupier of the premises on which the animal is, or on which the carcase is or was at the time of the death of the animal, and on service of such Notice the premises within the limits specified by the Notice shall become an Infected Place for the purposes of this Order.

(2.) A similar Notice may be so served on the occupier of any premises which in the opinion of the Local Authority have been infected with disease by the animal or carcase, or exposed to infection therefrom.

(3.) The restrictions imposed by a Notice under this Article shall continue in force until such Notice is withdrawn by a Notice (in the Form B set forth in the First Schedule hereto or to the like effect) signed by an Inspector of the Local Authority and served on the occupier of the Infected Place.

(4.) Where a Veterinary Inspector of the Board certifies that an animal or carcase was not diseased the Local Authority, on receipt of information to that effect, shall, as soon as practicable, cause a Notice (in the Form D set forth in the First Schedule hereto, or to the like effect) to be served on the occupier of the premises on which the animal or carcase was.

(5.) A Notice (Form A) shall not be served in relation to a market-place, fair-ground, sale-yard, place of exhibition, knacker's-yard, or slaughter-house except by direction of the Board.

Copies of Notices to be sent to the Board, etc.

8. An Inspector shall with all practicable speed send copies of any Notice served under the preceding Articles of this Order to the Secretary, Board of Agriculture and Fisheries, 4, Whitehall Place, London, S.W., and to the police officer in charge of the nearest police station of the District, and in the case of Notices (Forms A and D) also to the Medical Officer of Health.

Rules affecting Infected Places.

9. The following Rules shall apply to an Infected Place :—

Rule 1. The occupier of the Infected Place shall prevent access of animals to the diseased or suspected animal or carcase or to any part of the premises which has been exposed to infection of disease from the animal or carcase.

Rule 2. Animals shall not be moved, or allowed to stray, out of or into the Infected Place except as expressly authorised by this Article.

Rule 3. Any horse, ass, mule, or dog which is not diseased or suspected may be moved out of the Infected Place.

Rule 4. Any animal which is not diseased or suspected may be moved out of the Infected Place to the nearest available slaughter-house under the supervision of an Inspector or other officer of the Local Authority for the purpose of being forthwith slaughtered, or with the permission in writing of such Inspector to some premises which shall thereupon be made an Infected Place by service of a Notice (Form A) under this Order.

Rule 5. Litter, dung, broken fodder, utensils, pens, hurdles, or other things shall not be removed from the Infected Place except with permission in writing from an Inspector of the Local Authority.

Disposal of Carcases.

10.—(1.) A diseased carcase and any other carcase required by this Order to be destroyed shall be disposed of by the Local Authority as follows :

(i.) The Local Authority shall cause the carcase to be destroyed by exposure to a high temperature upon the farm or premises upon

which the carcase is, or upon the nearest available premises suitable for the purpose ; or

(ii.) The Local Authority may, if authorised by licence of the Board, cause the carcase to be destroyed, under the supervision of an Inspector or other officer of the Local Authority, in the mode following : The carcase shall be disinfected, and shall then be taken to premises approved for the purpose by the Board, and shall be there destroyed by exposure to a high temperature, or by chemical agents ; or

(iii.) Where the circumstances do not permit of the disposal of the carcase by either of the foregoing methods the Local Authority shall cause the carcase to be buried as soon as possible in its skin in some convenient or suitable place to which animals will not have access, and which is removed from any dwelling house, and at such a distance from any well or watercourse as will preclude any risk of the contamination of the water therein, the carcase being buried at a depth of not less than six feet below the surface of the earth, and with a layer of lime not less than one foot deep both beneath and above it. Where possible the place of burial shall be the farm or premises upon which the animal died or was slaughtered.

(2.) A diseased or suspected carcase shall not be buried or destroyed otherwise than by the Local Authority, or be removed from the farm or premises upon which the animal died or was slaughtered except by the Local Authority.

(3.) Before a carcase is moved for burial or destruction under this Article, all the natural openings thereof shall be effectually plugged with tow or some suitable material soaked in a saturated solution of carbolic acid or other disinfectant equal in disinfective efficiency. In no case shall the skin of the carcase be cut nor shall anything be done to cause the effusion of blood, except by a veterinary surgeon acting under the directions of the Local Authority, and so far only as may be necessary for the purpose of microscopical or cultural examination : Provided that nothing in this paragraph shall prevent a veterinary surgeon on behalf of the owner of the carcase from taking a sample of the blood, or other fluid, or tissue, from the carcase for the purpose of microscopical or cultural examination in any case in which neither the history of the case nor any external lesions in the carcase indicate the existence of anthrax.

(4.) A Local Authority may cause or allow a carcase to be taken into the District of another Local Authority to be buried or destroyed, with the previous consent of that Local Authority, but not otherwise.

Precautions to be adopted with Respect to Milk.

11. The milk produced by any diseased or suspected cow or goat shall not be mixed with other milk, and all milk affected by this Article shall forthwith be boiled or otherwise sterilised, and any utensil in which such milk is placed before being so treated shall be thoroughly cleansed with boiling water before any other milk is placed therein.

Digging up.

12. It shall not be lawful for any person, except with the Licence of the Board or permission in writing of an Inspector of the Board, to dig up, or cause to be dug up, the carcase of any animal that has been buried, whether under this Order or otherwise.

Cleansing and Disinfection in Case of Anthrax.

13.—(1.) The Local Authority shall at their own expense cause to be cleansed and disinfected under the direction of an Inspector, and in the mode provided by this Article—

- (a) all those parts of any shed, stable, building, field, or other place in which a diseased animal has died or been slaughtered, or has been kept at the date of such death or slaughter;
- (b) every utensil, pen, hurdle, or other thing used for or about any diseased animal or carcase;
- (c) every van, cart, or other vehicle used for carrying any diseased animal or carcase on land otherwise than on a railway.

(2.) Any part of a place or thing required by this Order to be cleansed and disinfected shall be cleansed and disinfected in manner following :—

- (i) the part of a place or thing shall be thoroughly soaked or drenched with a four per cent. (minimum) solution of carbolic acid (containing not less than ninety-five per cent. of actual carbolic acid); then
- (ii) the part of a place or thing shall, if the nature thereof so permit, be scraped and, where necessary, swept, and the scrapings and sweepings and all dung, sawdust, litter, and other matter shall be effectually removed therefrom; then
- (iii) the part of a place or thing shall be thoroughly washed or scrubbed or scoured with water, and then thoroughly coated or washed with—
 - (a) a one per cent. (minimum) solution of chloride of lime containing not less than thirty per cent. of available chlorine; or
 - (b) a four per cent. (minimum) solution of carbolic acid (containing not less than ninety-five per cent. of actual carbolic acid), followed by a thorough sprinkling with limewash; or

(c) a disinfectant equal in disinfective efficiency to the above-mentioned solution of carbolic acid, followed by a thorough sprinkling with limewash.

(3.) The scrapings and sweepings, and the dung, sawdust, litter, and other matter removed under this Article shall forthwith be burnt or otherwise destroyed, or if destruction is not practicable be well mixed with quicklime and be effectually removed from contact with animals.

(4.) The Local Authority shall at their own expense cause any litter, dung or broken fodder which appears to them or their Inspector to be likely to spread disease, to be disinfected thoroughly, or to be burnt or destroyed if it is in their or his opinion impracticable to disinfect the same thoroughly.

(5.) Where the cost of disinfection has been increased by any wilful act or neglect on the part of the owner of the animal or carcase, the Local Authority shall be entitled to recover from the owner the additional cost so caused.

*Facilities and Assistance to be given for Cleansing and
Disinfection.*

14.—(1.) The occupier of any place, and the owner of any thing, liable to be cleansed and disinfected under this Order shall give all reasonable facilities to the Local Authority and their officers for that purpose, and any person failing to give such facilities shall be deemed guilty of an offence against the Act of 1894.

(2.) The Local Authority may by Notice in writing signed by an Inspector and served on the occupier of any premises or the owner of any thing liable to be cleansed and disinfected under this Order require him to cleanse and disinfect the same in the mode provided by this Order but at the expense of the Local Authority, and any person failing to carry out the requirements of a Notice so served on him shall be deemed guilty of an offence against the Act of 1894.

*Prohibition of Exposure or Movement of Diseased or Suspected
Animals.*

15.—(1.) It shall not be lawful for any person—

- (a) to expose a diseased or suspected animal in a market or fair, or in a sale-yard, or other public or private place where animals are commonly exposed for sale; or
- (b) to place a diseased or suspected animal in a lair or other place adjacent to or connected with a market or a fair, or where animals are commonly placed before exposure for sale; or
- (c) to send or carry, or cause to be sent or carried, a diseased or suspected animal on a railway, canal, river, or inland navigation, or in a coasting vessel; or

- (d) to carry, lead, or drive, or cause to be carried, led, or driven, a diseased or suspected animal on a highway or thoroughfare; or
- (e) to place or keep a diseased or suspected animal on common or uninclosed land, or in a field or place insufficiently fenced, or in a field adjoining a highway unless that field is so fenced or situate that animals therein cannot in any manner come in contact with animals passing along that highway or grazing on the sides thereof; or
- (f) to graze a diseased or suspected animal on pasture being on the sides of a highway; or
- (g) to allow a diseased or suspected animal to stray on a highway or thoroughfare or on the sides thereof, or to be on common or uninclosed land, or in a field or place insufficiently fenced.

(2.) Notwithstanding anything in this Order an animal exposed or otherwise dealt with in contravention of this Article may be moved by or under the direction of an Inspector of the Local Authority to some convenient and isolated place.

Powers of Board of Agriculture and Fisheries.

16. Any powers by this Order conferred upon a Local Authority or an Inspector of a Local Authority may at any time be exercised by the Board or an Inspector of the Board respectively.

Local Authority to enforce Order.

17. The provisions of this Order, except where it is otherwise provided, shall be executed and enforced by the Local Authority.

Weekly Returns of Anthrax.

18. Where the existence of anthrax is certified under Article 5 of this Order by a Veterinary Inspector of the Board, an Inspector of the Local Authority shall forthwith make a return thereof to the Local Authority and to the Board, on a form provided by the Board, with all particulars therein required, and shall continue to so make a return thereof on the Saturday of every week until the disease has ceased.

Extension of Certain Sections of Diseases of Animals Act, 1894.

19. Horses, asses, mules and dogs (as well as the animals specified in the Act of 1894) shall be animals, and anthrax (that is to say, the disease called or known as anthrax, splenic fever, or splenic apoplexy of animals) shall be a disease, for the purposes of the following sections of the Act of 1894 (namely):

Section forty-three (*Police*);

Section forty-four (*General Administrative Provisions*);

and also for the purposes of all other sections of the said Act contain-

ing provisions relative to or consequent on the provisions of those sections and this Order, including such sections as relate to offences and legal proceedings.

Presumption of Knowledge of Disease.

20. Where the owner or person in charge of an animal or carcase is charged with an offence against the Act of 1894 relative to anthrax, he shall be presumed to have known of the existence of that disease, unless and until he shows, to the satisfaction of the Court, that he had not knowledge thereof and could not with reasonable diligence have obtained that knowledge.

Offences.

21.—(1.) If an animal or any thing is moved in contravention of this Order, or of a Notice served thereunder, the owner of the animal or thing, and the person for the time being in charge thereof, and the person causing, directing, or permitting the movement, and the person moving or conveying the animal or thing, and the owner and the charterer and the master of the vessel in which it is moved, and the consignee or other person receiving or keeping it knowing it to have been moved in contravention as aforesaid, and the occupier of the place from which the animal or thing is moved, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

(2.) If a carcase is buried or destroyed or otherwise dealt with in contravention of this Order, the owner of the carcase, and the person for the time being in charge thereof, and the person causing, directing, or permitting the carcase to be so buried, destroyed, or otherwise dealt with, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

Revocation of Order.

22. The Order described in the Second Schedule to this Order is hereby revoked.

Extent.

23. This Order extends to England and Wales and Scotland.

Commencement.

24. This Order shall come into operation on the first day of January, nineteen hundred and eleven.

FIRST SCHEDULE.

Forms.

FORM A.

[Articles 7 (1) and 9.]

Notice declaring Infected Place.

ANTHRAX ORDER OF 1910.

To C.D.

, of .

I, A.B. , of , being an Inspector appointed by the Local Authority of the [county] of , hereby give you notice as the occupier of the undermentioned premises that, in accordance with the provisions of the Order of the Board of Agriculture and Fisheries under which this Notice is issued, the undermentioned premises become an Infected Place subject to the Rules printed on the back of this Notice.

Dated this . day of , 191 .
(Signed) A.B.

Description of Infected Place.

The Rules in Article 9 are to be printed on the back of this Notice.

The expression 'animals' in the Rules means cattle, sheep, and goats, and all other ruminating animals, and swine, horses, asses, mules, and dogs.

The Inspector is with all practicable speed to send copies of this Notice to the Board of Agriculture and Fisheries, to the police officer in charge of the nearest police station of the District, and to the Medical Officer of Health.

FORM B.

[Article 7 (3).]

Withdrawal of Notice (Form A).

ANTHRAX ORDER OF 1910.

To C.D.

of

I, A.B. , of , being an Inspector appointed by the Local Authority for the [county] of , hereby withdraw, as from this . day of 191 , the Notice signed by . and served upon you on the . day of , 191 , relating to premises in your occupation at

Dated this . day of , 191 .
(Signed) A.B.

The Inspector is with all practicable speed to send copies of this Notice to the Board of Agriculture and Fisheries, and to the police officer in charge of the nearest police station of the District.

FORM C.

[Article 4 (2).]

*Notice to Occupier of Premises on which there is a Diseased
or Suspected Animal or Carcase.*

ANTHRAX ORDER OF 1910.

To the occupier of

Take notice that by the above-mentioned Order you, as the occupier of premises on which there is an animal [a carcase] which is affected with or suspected of anthrax, are required—

(i.) to prevent access of animals or fowls to the diseased or suspected animal [carcase], or to any part of the premises which has been exposed to infection of anthrax from the animal [carcase]; and

(ii.) to detain on the above premises any animal thereon affected with anthrax or suspected of being so affected and any other head of cattle, or sheep, or goat, or swine which has been in the same shed, stable, building, yard or field with the diseased or suspected animal [carcase]

until it is certified under the Order that the animal [carcase] was not affected with anthrax or a Notice (Form A) is served on you under Article 7 of the Order.

The expression 'animals' means cattle, sheep, and goats, and all other ruminating animals, and swine, horses, asses, mules, and dogs.

Dated this day of , 191 .

Inspector of the Local Authority for the
County [Borough] of

The Inspector is with all practicable speed to send copies of this Notice to the Board of Agriculture and Fisheries, and to the police officer in charge of the nearest police station of the District.

FORM D.

[Articles 5 (3) and 7 (4).]

Notice to Occupier of Result of Veterinary Examination.

To the occupier of

Take notice that the veterinary surgeon¹ directed by the Local Authority under the Anthrax Order of 1910 to examine [*here describe animal or carcase*] has certified that it was not affected with anthrax, and for the purposes of the provisions of the Order referred to in the Notice [Form C] served on you it is to be treated as not being affected with or suspected of anthrax.

Dated this day of , 191 .

Inspector of the Local Authority for the
County [Borough] of

The Inspector is with all practicable speed to send copies of this Notice to the Board of Agriculture and Fisheries, to the police officer in charge of the nearest police station of the District, and to the Medical Officer of Health.

¹ Where the examination is by a Veterinary Inspector of the Board the Notice should be altered accordingly.

SECOND SCHEDULE.

Order Revoked.

No.	Date.	Short Title.
5905	1899. 17 January	Anthrax Order of 1899.

SWINE-FEVER ORDERS.

(7447.)

ORDER OF THE BOARD OF AGRICULTURE AND FISHERIES.

(DATED 23RD APRIL 1908.)

SWINE-FEVER ORDER OF 1908.

The Board of Agriculture and Fisheries, by virtue and in exercise of the powers vested in them under the Diseases of Animals Acts, 1894 to 1903, and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows :

Notice of Disease.

1.—(1.) Every person having in his possession or under his charge a diseased or suspected pig, *i.e.*, a pig affected with or suspected of swine-fever, shall with all practicable speed give notice of the pig being so affected or suspected to a constable of the police force for the police area wherein the pig is.

(2.) The constable receiving such notice shall immediately transmit the information to the Board by telegram addressed 'Agrifi London.'

(3.) The constable shall also forthwith give information of the receipt by him of the notice to an Inspector of the Local Authority, who shall forthwith report the same to the Local Authority.

Duty of Inspector to act immediately.

2.—(1.) An Inspector of a Local Authority who (a) receives notice of disease under the preceding Article or (b) has reasonable ground for suspecting that swine-fever exists or has within twenty-eight days existed on any premises, shall forthwith serve a Notice (in the Form A set forth in the First Schedule to this Order or to the like effect) on the occupier of the premises on which there is or was the pig to which the notice of disease refers, or on the occupier of the premises on which he has reasonable ground for suspecting that swine-fever exists

or has within twenty-eight days existed, as the case may be, and shall in such Notice specify the limits of the Swine-Fever Infected Place.

(2.) On service of such Notice the premises within the limits specified by the Notice shall become a Swine-Fever Infected Place (in this Order referred to as an Infected Place) subject to the Rules contained in Article 3 of this Order.

(3.) The limits specified in the Notice shall as far as practicable include only the sty, shed or other inclosure in which a diseased or suspected pig is, or recently has been, but movement of swine into or out of any other adjoining premises in the same occupation as the said sty, shed or other inclosure shall by reason of such Notice become subject to the Rules contained in Article 5 of this Order, except that every licence must be granted by an Inspector of the Board.

(4.) An Inspector may place a notice or mark on any sty, shed or other inclosure if in his opinion this is necessary or convenient for identification with a Notice under this Article.

(5.) The Inspector of the Local Authority shall with all practicable speed send a copy of the Notice (Form A) to the Secretary, Board of Agriculture and Fisheries, 4, Whitehall Place, London, S.W., and shall also send copies of the same to the Local Authority and to the police officer in charge of the nearest police station of the District.

(6.) The restrictions imposed by a Notice under this Article shall continue in force until such Notice is withdrawn by a written Notice to that effect served by or on behalf of an Inspector or officer of the Board on the occupier of the Infected Place.

(7.) The limits of an Infected Place may at any time be altered by an Inspector or officer of the Board by Notice in writing served on the occupier of the Infected Place.

Rules for Infected Place.

3.—Rule 1. Swine shall not be moved into or out of an Infected Place except with a licence granted by an Inspector or officer of the Board.

Rule 2. Any carcase of a pig may be removed from an Infected Place if the carcase is intended to be used for the food of man and has been dressed for that purpose, and is not the carcase of a diseased or suspected pig or of a pig slaughtered under the Act of 1894, but the person who removes a carcase shall forthwith notify to an Inspector of the Local Authority of the District the fact of such removal, the place to which it was removed, and the name and address of any person to whom it was consigned. Subject to this provision carcasses of swine shall not be removed from an Infected Place except with permission in writing from an Inspector or officer of the Board or an Inspector of the Local Authority. The stomach and intestines of a pig shall not be removed from an Infected Place except by an Inspector

or officer of the Board or an Inspector of the Local Authority for examination or destruction.

Rule 3. Litter, dung, utensils, pens, hurdles, or other things shall not be removed from an Infected Place except with permission in writing from an Inspector or officer of the Board or an Inspector of the Local Authority, which permission shall not be granted until such things have been thoroughly disinfected.

Rule 4. No person (except the person tending the pig) shall, unless authorised by an Inspector or officer of the Board, or an Inspector of the Local Authority, enter any sty, shed or other inclosure, being part of an Infected Place, in which a diseased or suspected pig is or has recently been kept.

Rule 5. Every person upon leaving any such sty, shed or other inclosure shall thoroughly wash his hands with soap and water, and his boots with a solution of carbolic acid or other suitable disinfectant.

Rule 6. A person tending a diseased or suspected pig shall not tend any pig not diseased or suspected.

Provision for placing Premises under Movement Restrictions.

4.—(1.) For the purpose of preventing the spread of disease an Inspector of the Local Authority may serve a Notice (in the Form B set forth in the First Schedule to this Order or to the like effect) on the occupier of any premises defined in the Notice on which he has reason to believe that there is, or recently has been, either a diseased or suspected pig, or a pig which has been exposed to infection, or the dung of a diseased or suspected pig, or some other possible source of infection, and thereupon movement of swine into or out of such premises shall by reason of such Notice become subject to the Rules contained in Article 5 of this Order.

(2.) A Notice under this Article may be served on the occupier of any premises immediately after the withdrawal of a Notice (Form A) declaring part thereof to be an Infected Place.

(3.) The restrictions imposed by a Notice under this Article shall remain in force until such Notice is withdrawn by a further Notice (Form C) signed by an Inspector of the Local Authority or of the Board and served on the occupier of the premises.

(4.) The Inspector shall with all practicable speed send copies of any Notice served by him under this Article to the Local Authority and to the police officer in charge of the nearest police station of the District.

Rules affecting Premises under Movement Restrictions.

5. The following Rules shall apply to all premises on which movement of swine is restricted under the preceding Articles of this Order, but subject to the provision of Article 2 (3) as to granting of licences.

Rule 1. Swine shall not be moved out of the premises except on the following conditions :

- (a) The movement must be authorised by a licence granted by an Inspector of the Local Authority or of the Board ;
- (b) The movement must be direct to a bacon-factory or slaughterhouse and not elsewhere, and the bacon-factory or slaughterhouse shall be specified in the licence ;
- (c) The swine shall before movement be marked by and at the expense of the owner by the painting with an indelible composition of red colour of a broad line down the back and another broad line across the loins of each of the swine, thus +, each line being not less than nine inches long ;
- (d) During the movement the swine shall, except while being moved by railway or vessel, be moved in a float, van or cart, and shall not be permitted to come in contact with swine not marked in manner prescribed by this Article ;
- (e) The swine shall after their arrival at the bacon-factory or slaughterhouse be there detained until they are slaughtered ;
- (f) The licence shall forthwith after completion of the movement be delivered up at, or sent by post to, the nearest police station of the District by the person in charge of the swine at the time of completing the movement ;
- (g) Swine while being moved for slaughter with a licence under this Article shall not be subject to the restrictions on movement imposed by the Swine-Fever (Regulation of Movement) Order of 1908, or any Regulations made under this Order. ,

Rule 2. An Inspector who grants a licence authorising movement from premises in one District to a bacon-factory or slaughterhouse in another District shall forthwith send a copy of the licence to the Local Authority of the last-mentioned District.

Rule 3. The occupier of the premises shall forthwith give notice of the death or illness of any pig on the premises to an Inspector of the Local Authority, unless the cause of death or the illness is clearly not swine-fever. The Inspector receiving such notice shall immediately transmit the information to the Board by telegram addressed 'Agrifi London.'

Rule 4. Swine shall not be moved into the premises unless such movement is authorised by a licence of an Inspector of the Local Authority of the District in which such premises are situate, or of the Board, and any swine so moved shall be kept separate from other swine on the premises for a period of twenty-eight days after their arrival.

Disposal of Carcasses

6.—(1.) The carcase of any diseased or suspected pig (other than a pig slaughtered under the Act of 1894) shall be disposed of by the Local Authority as follows :.

- (i.) The Local Authority shall cause the carcase either to be buried as soon as possible in its skin in some proper place, and covered with a sufficient quantity of quicklime or other disinfectant, and with not less than six feet of earth, or to be destroyed by burning upon the premises where the pig died or was slaughtered ; or
- (ii.) The Local Authority may, if authorised by licence of the Board cause the carcase to be destroyed, under the inspection of the Local Authority, in the mode following : The carcase shall be disinfected, and shall then be taken, in charge of an officer of the Local Authority, to the premises approved for the purpose by the Board, and shall be there destroyed by exposure to a high temperature or by chemical agents.

(2.) A carcase of a diseased or suspected pig shall not be buried or destroyed otherwise than by the Local Authority, or be removed from the farm or premises upon which the pig died or was slaughtered except for the purpose of being buried or destroyed by the Local Authority.

(3.) Where under this Article a Local Authority cause a carcase to be buried they shall first cause its skin to be so slashed as to be useless.

(4.) A Local Authority may cause or allow a carcase to be taken into the District of another Local Authority to be buried or destroyed with the previous consent of that Local Authority, but not otherwise.

Digging up.

7. It shall not be lawful for any person, except with a licence of the Board or permission in writing of an Inspector of the Board, to dig up, or cause to be dug up, the carcase of any pig that has been buried.

Cleansing and Disinfection by Inspector.

8.—(1.) An Inspector of the Local Authority may cause to be cleansed and disinfected any sty or other place which has been used for a diseased or suspected pig, and any utensil, pen, hurdle, or other thing used for or about such pig, and any wood-work with which such pig has come in contact.

(2.) An Inspector of the Local Authority may cause to be cleansed and disinfected any van, cart, or other vehicle used for the carrying of a diseased or suspected pig, and any rope, net, or other apparatus used in the conveyance of such pig on land otherwise than on a railway.

(3.) An Inspector of the Local Authority may cause any dung of a diseased or suspected pig and any fodder and litter that has been in

contact with or used about such pig to be disinfected, burnt, or destroyed.

(4.) The owner, occupier and person in charge of any place, and the owner and person in charge of any utensil, pen, hurdle, or other thing, or any van, cart, or other vehicle, or any dung, fodder, or litter, to which this Article applies shall give all reasonable facilities to an Inspector for the carrying out of the provisions of this Article.

(5.) An Inspector of the Local Authority may, instead of exercising the foregoing powers, serve a Notice on the occupier of any such sty or place as aforesaid or on the owner of any such utensil, pen, hurdle, van, cart, vehicle, rope, net, apparatus, dung, fodder, litter or other thing requiring him at his own expense to cleanse and disinfect any such place or thing, or to burn or destroy any such dung, fodder, or litter, and in such case he shall forthwith carry out such cleansing, disinfection, or destruction to the satisfaction of the Inspector.

(6.) The expenses of any cleansing or disinfection carried out by an Inspector of a Local Authority shall be defrayed by such Local Authority.

Cleansing and Disinfection of Lairs, etc., used for Swine.

9. Any building, shed, outhouse, yard, sty, or other place used for the temporary keeping or detention of swine prior or subsequent to their being exposed for sale in or at a market, fair, sale-yard, place of exhibition, or other place, public or private, where swine are commonly exposed for sale, shall be cleansed and disinfected in manner prescribed by Article 13 of this Order by and at the expense of the occupier thereof once at least in every seven days, if the place has been used for swine during such period, and also at any time forthwith upon the receipt of a Notice in writing signed by an Inspector of the Board or of the Local Authority requiring such cleansing and disinfection, provided that this Article shall only extend and apply to the parts of a building, shed, outhouse, yard, sty, or other place with which a pig or its droppings have come in contact.

Cleansing and Disinfection of Pig-Dealers' Premises.

10. The provisions of the preceding Article shall also apply to any building, shed, outhouse, yard, sty, or other place occupied by a pig-dealer, and used by him for the keeping or detention of swine in connection with his trade or business of a pig-dealer.

Cleansing and Disinfection of Vehicles used in connection with Pig-Dealing.

11. The floor of any van, cart, or other vehicle used in connection with the trade or business of a pig-dealer for the conveyance of swine along any highway or thoroughfare and all other parts thereof with

which any pig or its droppings have come in contact shall be cleansed and disinfected in manner prescribed by Article 13 of this Order by and at the expense of the person using the same for such purpose as soon as practicable after such use and before being again used for such purpose, and also at any time forthwith upon the receipt of a Notice in writing signed by an Inspector of the Board or of the Local Authority requiring such cleansing and disinfection.

Cleansing and Disinfection of Crates, etc., used by Pig-Dealers for Conveyance of Swine.

12. Any crate, box, hamper, net, rope or other thing used by a pig-dealer in connection with his trade or business of a pig-dealer for the conveyance of swine along any highway or thoroughfare or on a railway shall be cleansed and disinfected in manner prescribed by Article 13 of this Order by and at the expense of the person using the same for such purpose as soon as practicable after such use and before being again used for such purpose, and also at any time forthwith upon receipt of a Notice in writing signed by an Inspector of the Board or of the Local Authority requiring such cleansing and disinfection.

Manner of Cleansing and Disinfection prescribed by this Order.

13.—(1.) Any part of a place or thing required by this Order to be cleansed and disinfected shall be cleansed and disinfected in manner following :

- (i.) The part of a place or thing shall, if the nature thereof so permit, be scraped and, where necessary, swept, and the scrapings and sweepings and all dung, sawdust, litter, and other matter shall be effectually removed therefrom ; then
- (ii.) The part of a place or thing shall be thoroughly washed or scrubbed or scoured with water ; then
- (iii.) The part of a place or thing shall be thoroughly coated or washed with—
 - (a) a one per cent. (minimum) solution of chloride of lime containing not less than thirty per cent. of available chlorine ; or
 - (b) a five per cent. (minimum) solution of carbolic acid (containing not less than ninety-five per cent. of actual carbolic acid), followed by a thorough sprinkling with limewash ; or
 - (c) a disinfectant equal in disinfective efficiency to the above-mentioned solution of carbolic acid, followed by a thorough sprinkling with limewash.

(2.) The scrapings and sweepings, and the dung, sawdust, litter, and other matter removed under this Article shall forthwith be well mixed with quicklime and be effectually removed from contact with swine.

Powers of Local Authority in Case of Default.

14.—(1.) If any person fails to cleanse and disinfect any building, shed, outhouse, yard, sty, or other place, or any van, cart, or other vehicle, or any crate, box, hamper, net, rope, or other thing, in accordance with this Order, it shall be lawful for the Local Authority, without prejudice to the recovery of any penalty for such failure, to cause such building, shed, outhouse, yard, sty, or other place, or such van, cart, or other vehicle, or such crate, box, hamper, net, rope, or other thing to be cleansed and disinfected in manner prescribed by Article 13 of this Order, and to recover summarily the expenses of such cleansing and disinfection from the person in default.

(2.) The owner and occupier and person in charge of any place, vehicle, or thing to which this Article applies, shall give all reasonable facilities to the Local Authority for the carrying out of the provisions of this Article.

Regulations of Local Authority as to Entry of Swine into Markets, Sales, etc.

15. A Local Authority may, with a view to securing the inspection or examination by an officer of the Local Authority of Swine entering any market, fair, auction, sale-yard, or place of exhibition within their District, make such Regulations as they think fit for such purpose, and in particular for the regulating of the mode and time of such entry, and may by subsequent Regulation alter or revoke any Regulation so made.

Regulations of Local Authority as to Keeping of Registers by Owners of Boars and by Pig-Dealers.

16.—(1.) A Local Authority may, with a view to the prevention of the spread of swine-fever, make such Regulations as they think fit for the following purposes, or any of them :

- (a) For requiring the owner of any boar used for service of sows other than his own to keep a register of the owners of sows served by the boar, the premises from and to which the sow is moved before and after the service, and the dates of service ;
- (b) For requiring every pig-dealer to keep a register open to inspection by any Inspector of the Board or the Local Authority with such particulars of his purchases and sales of swine as may be prescribed by the Regulations ; and
- (c) For requiring the cleansing and disinfection in manner prescribed by Article 13 of this Order, and by the owners thereof of vans, carts, or other vehicles used for carrying swine, or of ropes, nets, or other apparatus used in the conveyance of swine, on land otherwise than on a railway.

(2.) Any Regulation may be altered or revoked by the Local Authority by a subsequent Regulation.

Provisions as to Regulations of Local Authority.

17.—(1.) Every Local Authority shall forthwith send to the Board two copies of every Regulation made by them under this Order.

(2.) If the Board are satisfied on inquiry, with respect to any Regulation made or any Notice served by a Local Authority under this Order, that the same is for any reason objectionable, and direct the revocation thereof, the same shall thereupon cease to operate.

Prohibition to Expose or Move Diseased or Suspected Swine.

18.—(1.) It shall not be lawful for any person—

- (a) to expose a diseased or suspected pig in a market or fair, or in a sale-yard, or other public or private place where swine are commonly exposed for sale ; or
- (b) to place a diseased or suspected pig in a lair or other place adjacent to or connected with a market or a fair, or where swine are commonly placed before exposure for sale ; or
- (c) to send or carry or cause to be sent or carried a diseased or suspected pig on a railway, canal, river, or inland navigation, or in a coasting vessel ; or
- (d) to carry, lead, or drive, or cause to be carried, led, or driven, a diseased or suspected pig on a highway or thoroughfare ; or
- (e) to place or keep a diseased or suspected pig on common or uninclosed land, or in a field or place insufficiently fenced, or in a field adjoining a highway unless that field is so fenced or situate that swine therein cannot in any manner come in contact with swine passing along that highway or grazing on the sides thereof ; or
- (f) to graze a diseased or suspected pig on pasture being on the sides of a highway ; or
- (g) to allow a diseased or suspected pig to stray on a highway or thoroughfare or on the sides thereof or on common or uninclosed land or in a field or place insufficiently fenced.

(2.) This Article shall operate subject to any provisions of this Order providing for or directing the movement of swine in cases therein mentioned.

Swine-Fever found in a Market, Railway Station, Grazing-Park, or other like Place, or during Transit.

19. Where in contravention of the preceding Article a diseased or suspected pig is exposed, carried, kept, or otherwise dealt with, in or on any market, fair-ground, sale-yard, place of exhibition, lair, landing-place, wharf, railway station, common, uninclosed land, field, yard,

sty, farm, park, or other place (not being a Foreign Animals Wharf or a Foreign Animals Quarantine Station), the following provisions shall apply (namely) :

(Seizure of Swine.)

(i.) The Inspector of the Local Authority shall cause to be seized the diseased or suspected pig, and also all swine in or on the market, fair, sale-yard, place of exhibition, lair, landing-place, wharf, railway station, common, uninclosed land, field, yard, sty, farm, park, or other such place as aforesaid, which in his opinion have been exposed to infection by contact with the diseased or suspected pig, and shall forthwith transmit information of such seizure to the Board by telegram addressed 'Agrifi London.'

(ii.) The Inspector of the Local Authority shall cause all swine so seized to be moved to some convenient premises for such detention and isolation as is required by this Article.

(iii.) The Inspector of the Local Authority shall cause, as far as practicable, all diseased or suspected swine to be kept separate during such movement and detention from swine not diseased or suspected.

(iv.) The Inspector shall secure the detention and isolation of any diseased or suspected pig so seized by service of a Notice (Form A) on the occupier of the premises to which it is moved under this Article.

(v.) The Inspector shall secure the detention of any other pig so seized by service of a Notice (Form B) on the occupier of the premises to which it is moved under this Article.

(vi.) Any pig seized under this Article may be slaughtered by or at the request of the owner or person in charge thereof either at the place where it is seized or at the nearest available slaughter-house in the District; in which latter case the pig may be moved for the purpose of being there slaughtered under and in accordance with the conditions (if any) of a licence granted by an Inspector of the Local Authority, and shall be there slaughtered accordingly; and that licence shall be available for twelve hours and no longer, and shall specify the slaughter-house to which the pig is to be moved for slaughter.

(Declaration of Infected Place by Board only.)

(vii.) The market, fair, sale-yard, place of exhibition, lair, landing-place, wharf, railway station, common, uninclosed land, field, yard, sty, farm, park, or other such place shall not be declared to be an Infected Place except by the Board.

(Disinfection in these Cases.)

(viii.) The market, fair, sale-yard, place of exhibition, lair, landing-place, wharf, railway station, common, uninclosed land, field, yard, sty, farm, park, or other such place as aforesaid, shall not be used or permitted to be used for swine by the Market Authority or the owner

or occupier of any such other place until that portion of the market or other place aforesaid where the diseased or suspected pig was found has been, as far as practicable, cleansed and disinfected, and a certificate to that effect has been given by a Veterinary Inspector of the Local Authority.

(Reports.)

(ix.) The Inspector of the Local Authority acting under this Article shall forthwith report to the Local Authority the proceedings taken by him thereunder, and the Local Authority shall forthwith report the same to the Board.

(Expenses.)

(x.) The Local Authority may recover the expenses of the execution by them or by their Inspector or other officer of the provisions of this Article from the owner of the swine seized, or from the consignor or consignee thereof, who may recover the same from the owner, by proceedings in any court of competent jurisdiction.

Food and Water during Detention.

20. An Inspector of the Local Authority detaining a pig under this Order shall cause it to be supplied with requisite food and water during its detention; and the expenses incurred by him in respect thereof may be recovered from the person having charge of the pig, or from its owner, by proceedings in any court of competent jurisdiction.

Monthly Returns of Swine remaining on Premises on which Existence of Swine-Fever has been confirmed.

21. The Local Authority shall cause a return to be made to the Board, on a form provided by the Board, with all particulars therein required, of the number of swine remaining on premises affected by a Notice (Form A), on the last day of each month, except where the last day is Sunday, and then on the last day but one, until the Notice is withdrawn.

Production of Licences; Names and Addresses.

22.—(1.) Every person in charge of a pig or thing being moved, where under this Order or under any Regulation of a Local Authority under this Order a Movement Licence is necessary, shall, on demand of a Justice, or of a constable, or of an Inspector or other officer of the Board or of a Local Authority, produce and show to him the Movement Licence, if any, authorising the movement, and shall allow it to be read and a copy of or extract from it to be taken by the person to whom it is produced.

(2.) Every person so in charge shall, on demand as aforesaid, give his name and address to the Justice, or constable, or Inspector or other officer.

Powers of the Board of Agriculture and Fisheries.

23. Any powers by this Order conferred upon a Local Authority or an Inspector of a Local Authority may at any time be exercised by the Board or an Inspector of the Board respectively.

Local Authority to enforce Order.

24. The provisions of this Order, except where it is otherwise provided, shall be executed and enforced by the Local Authority.

Documents and Forms.

25. Every Local Authority shall provide and supply to their Inspectors and officers such documents and forms as may be necessary for the purposes of this Order.

Granting of Movement Licences.

26.—(1.) A Licence shall be granted for the movement of swine under this Order only where in the opinion of the Local Authority or the person granting the licence, as the case may be, the granting of such licence is necessary or expedient.

(2.) A Movement Licence granted under this Order or under any Regulation of a Local Authority under this Order shall not be available if granted by the owner of the swine to be moved or by his agent, or by the owner or consignee or other person selling the swine or exposing the swine for sale, or by the purchaser thereof or by his agent, or by the auctioneer or other person conducting or licensed to hold the sale at which the swine are exposed, or by the occupier of the farm or premises or slaughter-house from or to which the swine are to be moved, or by any individual member of an Executive Committee or Sub-Committee of a Local Authority.

Offences.

27.—(1.) If a pig is moved in contravention of this Order, or of a Notice served under this Order, or of any Regulation made by a Local Authority under this Order, or of the conditions of a Movement Licence thereunder, the owner of the pig, and the person for the time being in charge thereof, and the person causing, directing, or permitting the movement, and the person moving or conveying the pig, and the owner and the charterer and the master of the vessel in which it is moved, and the consignee or other person receiving or keeping it, knowing it to have been moved in contravention as aforesaid, and the occupier of the place from which the pig is moved, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

(2.) If a person in charge of a pig being moved, where under this Order, or under any Regulation made by a Local Authority under this Order, a Movement Licence is necessary, on demand made under this Order, fails to give his true name and address, or gives a false name or address, he shall be deemed guilty of an offence against the Act of 1894.

(3.) If a pig is not slaughtered as required by this Order, or by any Regulation made by a Local Authority under this Order, or by the conditions of a licence thereunder, the person to whom the licence is granted, and the owner of the pig and the person for the time being in charge thereof, and the person failing to cause the same to be so slaughtered, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

(4.) If, in contravention of this Order, a carcass is removed, the owner of the carcass, and the person for the time being in charge thereof, and the person causing, directing, or permitting the removal, and the person removing or conveying the carcass, and the owner and the charterer and the master of the vessel in which it is removed, and the consignee or other person receiving or keeping it, knowing it to have been removed in contravention as aforesaid, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

(5.) If any person with a view unlawfully to evade or defeat the operation of this Order or of any Regulation made by a Local Authority under this Order, allows a pig to stray, he shall be deemed guilty of an offence against the Act of 1894.

(6.) If any person, with a view unlawfully to evade or defeat the operation of this Order, by washing, or in any other manner, takes out, effaces, or obliterates, or attempts to take out, efface, or obliterate, any mark placed on any pig or on any sty, shed or other inclosure for the purpose of this Order, the person doing the same, and the person causing, directing, or permitting the same to be done, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

(7.) If anything is omitted to be done as regards cleansing or disinfection in contravention of this Order, the occupier of any place in or in respect of which the same is omitted shall, according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

Interpretation.

28. In this Order, unless the context otherwise requires,—

‘The Board’ means the Board of Agriculture and Fisheries :

‘The Act of 1894’ means the Diseases of Animals Act, 1894 :

‘Inspector’ includes Veterinary Inspector :

‘Carcase’ means the carcase of a pig, and includes part of such a carcase, and the intestines, meat, bones, skin, offal, or other part of a pig, separately or otherwise, or any portion thereof:

‘Police force’ and ‘police area’ have the meanings assigned to them by the Police Act, 1890, or the Police (Scotland) Act, 1890, as the case may be:

‘Bacon factory’ means premises in which the business of a curer of bacon is carried on:

‘Slaughterhouse’ means any premises where animals are habitually slaughtered:

‘Pig-Dealer’ means a person habitually engaged in the trade or business of selling swine (other than swine bred by him), but does not include a person who as auctioneer sells swine which are the property of another person.

Other terms have the same meaning as in the Act of 1894.

Revocation of Orders.

29. The Orders described in the Second Schedule to this Order are hereby from and after the commencement of this Order revoked.

Existing Regulations of Local Authority.

30. All regulations made by a Local Authority under any Order hereby revoked, and in force immediately before the commencement of this Order, shall have effect as if they were authorised by and made under this Order, and shall continue in force until they are revoked by the Local Authority.

Extent.

31. This Order extends to England and Wales and Scotland.

Commencement.

32. This Order shall come into operation on the first day of June, nineteen hundred and eight.

Short Title.

33. This Order may be cited as the SWINE-FEVER ORDER OF 1908.

FIRST SCHEDULE.

Forms.

FORM A.

(Articles 2 and 19.)

*Notice defining Infected Place.**Diseases of Animals Acts.*

SWINE-FEVER ORDER OF 1908.

To C.D.

, of

I, A.B.

, of

, being an Inspector appointed by the Local Authority for the [county] of , hereby give you notice as the occupier of the undermentioned premises, that in accordance with the provisions of the Order of the Board of Agriculture and Fisheries under which this Notice is given, the undermentioned premises are hereby declared to be a Swine Fever Infected Place for the purposes of the said Order.

Dated this day of

, 19 .
(Signed) A.B.

 Description of Infected Place stating Parish.

The restrictions imposed by this Notice remain in force until this Notice is withdrawn by a subsequent Notice.

The Inspector is with all practicable speed to send a copy of this Notice to the Secretary, Board of Agriculture and Fisheries, 4, Whitehall Place, London, S.W., to the Local Authority, and to the police officer in charge of the nearest police station of the District.

The following Rules (1) and (2) are to be printed as Indorsement on Form A.

SWINE-FEVER ORDER OF 1908.

(1) *Rules to be observed on the Swine-Fever Infected Place.*

Swine shall not be moved into or out of the Infected Place except with a licence granted by an Inspector or officer of the Board.

Any carcase of a pig may be removed from the Infected Place if it is intended to be used for the food of man and has been dressed for that purpose, and is not the carcase of a diseased or suspected pig or of a pig slaughtered under the Diseases of Animals Act, 1894, but the person who removes it shall forthwith notify to an Inspector of the Local Authority of the District the fact of such removal, the place to which it was removed, and the name and address of any person to whom it was consigned. Subject to this provision carcases of swine shall not be removed from the Infected Place except with permission in writing

from an Inspector or officer of the Board or an Inspector of the Local Authority. The stomach and intestines of a pig shall not be removed from the Infected Place except by an Inspector or officer of the Board or an Inspector of the Local Authority for examination or destruction.

Litter, dung, utensils, pens, hurdles, or other things shall not be removed from the Infected Place except with permission in writing from an Inspector or officer of the Board or an Inspector of the Local Authority, which permission shall not be granted until such things have been thoroughly disinfected.

No person (except the person tending the pig) shall, unless authorised by an Inspector or officer of the Board or by an Inspector of the Local Authority, enter any sty, shed or other inclosure, being part of the Infected Place, in which a diseased or suspected pig is or has recently been kept.

Every person upon leaving any such sty, shed or other inclosure shall thoroughly wash his hands with soap and water, and his boots with a solution of carbolic acid or other suitable disinfectant.

A person tending a diseased or suspected pig shall not tend any pig not diseased or suspected.

Note. — The expression 'Carcase,' unless the context otherwise requires, means the carcase of a pig, and includes part of such a carcase, and the intestines, meat, bones, skin, offal, or other part of a pig, separately or otherwise, or any portion thereof.

(2) *Rules to be observed on any other adjoining premises in the same occupation as the Infected Place.*

Swine shall not be moved out of the premises except on the following conditions :

(a) The movement must be authorised by a licence granted by an Inspector of the Board ;

(b) The movement must be direct to a bacon-factory or slaughterhouse and not elsewhere, and the bacon-factory or slaughterhouse must be specified in the licence ;

(c) The swine shall before movement be marked by and at the expense of the owner by the painting with an indelible composition of red colour of a broad line down the back and another broad line across the loins of each of the swine thus +, each line being not less than nine inches long ;

(d) During the movement the swine shall, except while being moved by railway or vessel, be moved in a float, van or cart, and shall not be permitted to come in contact with swine not marked in the prescribed manner ;

(e) The swine shall after their arrival at the bacon-factory or slaughterhouse be there detained until they are slaughtered ;

(f) The licence shall forthwith after completion of that movement be delivered up at, or sent by post to, the nearest police station of the District by the person in charge of the swine at the time of completing the movement ;

(g) Swine while being moved for slaughter with a licence under these Rules shall not be subject to the restrictions on movement imposed by the Swine-Fever (Regulation of Movement) Order of 1908, or any regulations made under the Swine-Fever Order of 1908.

Swine shall not be moved into the premises unless such movement is authorised by a licence of an Inspector of the Board, and any swine so moved shall be kept separate from other swine on the premises for a period of twenty-eight days after their arrival.

The occupier of the premises shall forthwith give notice of the death or illness of any pig on the premises to an Inspector of the Local Authority, unless the cause of death or the illness is clearly not swine-fever.

FORM B.

(Articles 4 and 19.)

*Notice placing Premises under Movement Restrictions.
Diseases of Animals Acts.*

SWINE-FEVER ORDER OF 1908.

To C.D.

of

I, A.B., of _____, being an Inspector appointed by the Local Authority of the [county] of _____, hereby give you notice as the occupier of the undermentioned premises that, in accordance with the provisions of the Order of the Board of Agriculture and Fisheries under which this Notice is issued, movement of swine into or out of the undermentioned premises becomes subject to the Rules printed on the back of this Notice.

Dated this _____ day of _____, 19 ____ (Signed) _____ A.B.

Description of Premises under Movement Restrictions stating Parish.

The restrictions imposed by this Notice remain in force until this Notice is withdrawn by a subsequent Notice.

The Inspector is with all practicable speed to send copies of this Notice to the Local Authority and to the police officer in charge of the nearest police station of the District.

To be printed as Indorsement on Form B.

SWINE-FEVER ORDER OF 1908.

Rules.

Swine shall not be moved out of the premises except on the following conditions :

(a) The movement must be authorised by a licence granted by an Inspector of the Local Authority or of the Board;

(b) The movement must be direct to a bacon-factory or slaughterhouse and not elsewhere and the bacon-factory or slaughterhouse must be specified in the licence ;

(c) The swine shall before movement be marked by and at the expense of the owner by the painting with an indelible composition of red colour of a broad line down the back and another broad line across the loins of each of the swine thus +, each line being not less than nine inches long ;

(d) During the movement the swine shall, except while being moved by railway or vessel, be moved in a float, van or cart, and shall not be permitted to come in contact with swine not marked in the prescribed manner ;

(e) The swine shall after their arrival at the bacon-factory or slaughterhouse be there detained until they are slaughtered ;

(f) The licence shall forthwith after completion of the movement be delivered up at, or sent by post to, the nearest police station of the District by the person in charge of the swine at the time of completing the movement ;

(g) Swine while being moved for slaughter with a licence under these Rules shall not be subject to any restrictions on movement imposed by the Swine-Fever (Regulation of Movement) Order of 1908, or any Regulations made under the Swine-Fever Order of 1908.

Swine shall not be moved into the premises unless such movement is authorised by a licence of an Inspector of the Local Authority of the District in which such premises are situate or of the Board, and any swine so moved shall be kept separate from other swine on the premises for a period of twenty-eight days after their arrival.

The occupier of the premises shall forthwith give notice of the death or illness of any pig on the premises to an Inspector of the Local Authority, unless the cause of death or the illness is clearly not swine-fever.]

FORM C.

(Article 4.)

Withdrawal of Notice (Form B).

Diseases of Animals Acts.

SWINE-FEVER ORDER OF 1908.

To C.D.

I, A.B. of _____, of _____, being an Inspector appointed by the Local Authority for the [county] of _____, hereby withdraw, as from this _____ day of _____, 19____, the Notice signed by _____ and served upon you on the _____ day of _____, 19____, relating to premises in your occupation at _____.

Dated this _____ day of _____, 19____.

(Signed) _____ A.B.

The Inspector is with all practicable speed to send copies of this Notice to the Local Authority and to the police officer in charge of the nearest police station of the District.

SECOND SCHEDULE.

Orders Revoked.

(Article 29.)

No.	Date.	Short Title.
5193	1894. 10 July ...	The Swine-Fever Order of 1894.
6339	1901. 28 August...	The Swine-Fever Order of 1901.

(7448.)

ORDER OF THE BOARD OF AGRICULTURE AND FISHERIES.

(DATED 23RD APRIL 1908.)

SWINE-FEVER (REGULATION OF MOVEMENT)
ORDER OF 1908.

The Board of Agriculture and Fisheries, by virtue and in exercise of the powers vested in them under the Diseases of Animals Acts, 1894 to 1903, and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows :

Application of Order.

1.—(1.) In this Order 'Scheduled Area' means an Area to which Part I. of this Order is applied by this or any subsequent Order of the Board, and 'Infected Area' means an area declared by Order of the Board to be a Swine-Fever Infected Area.

(2.) An Area declared by Order of the Board to be a Swine-Fever Infected Area shall not by reason of such declaration cease to form part of any Scheduled Area.

PART I.—SCHEDULED AREAS.

Restriction on Movement into Scheduled Area.

2. Swine shall not be moved into a Scheduled Area except in accordance with the provisions of this Order authorising such movement.

Provision for Movement with Licence.

3.—(1.) Swine may be moved to premises in a Scheduled Area from premises outside that Area if accompanied by a licence (Form A) authorising such movement granted by an Inspector of the Local

Authority of the District in which the place of destination specified in the licence is situate.

(2.) Before a licence is granted by an Inspector under this Article, the owner of the swine, or his agent authorised in writing for this purpose, shall sign, and deliver or send by post to the Inspector, a declaration (Form B) countersigned as hereinafter provided.

(3.) The declaration shall not be effective until it is countersigned by a police officer of the District where the swine are, who, before countersigning the declaration, shall, so far as is practicable, satisfy himself as to the correctness of the statements contained therein.

(4.) The declaration shall be retained by the Inspector granting the licence thereon.

Detention and Isolation after Arrival at Destination.

4.—(1.) Swine moved with a licence under the preceding Article shall not, for a period of twenty-eight days after arrival at the place of destination specified in the licence, be moved from such place of destination, except as hereinafter provided.

(2.) Where swine are moved with a licence under the preceding Article to a market, fairground or saleyard, specified in the licence, the swine shall be moved from such premises only if accompanied by a licence (Form C) authorising such movement granted by an Inspector of the Local Authority of the District in which the market, fairground or saleyard is situate and only to a bacon-factory or slaughterhouse specified in the licence, where the swine shall be detained until they are slaughtered, or to the premises from which the swine were moved to the market, fairground or saleyard. In the latter case the swine shall not, for a period of twenty-eight days after their arrival at the premises, be moved therefrom except as hereinafter provided.

(3.) Swine required by this Article to be detained for a period of twenty-eight days may be moved before the expiration of that period to a bacon-factory or slaughterhouse in the same Scheduled Area if such movement is authorised by a licence (Form C) granted by an Inspector of the Local Authority of the District in which the swine are detained, and the swine are accompanied by the licence.

(4.) Swine, while detained under this Article, shall be kept separate from all other swine.

Movement into Scheduled Area for Immediate Slaughter.

5.—(1.) Swine may also be moved to a bacon-factory or slaughterhouse in a Scheduled Area, or to any lairs, market, or saleyard in a Scheduled Area specially authorised to be used for such purpose by the Local Authority of the District, from premises outside that Area if

accompanied by a licence (Form D) authorising such movement granted by an Inspector of the Local Authority of the District in which the premises from which the swine are to be moved are situate, and subject to the following conditions, namely :

- (i.) The swine shall be marked by and at the expense of the owner by the painting with an indelible composition of red colour of a broad line down the back and another broad line across the loins of each of the swine thus +, each line being not less than nine inches long ;
- (ii.) During the movement the swine shall, except while being moved by railway or vessel, be conveyed in a float, cart, or van, and the swine shall not be permitted to come in contact with swine not marked in manner prescribed by this Article ;
- (iii.) Swine moved under this Article to any lairs, market, or saleyard shall be moved therefrom only if accompanied by a licence (Form D) authorising such movement granted by an Inspector of the Local Authority of the District in which the lairs, market, or saleyard are situate and only to a bacon-factory or slaughter-house specified in the licence, and such movement shall be subject to the conditions of this Article as to marking and movement ; and
- (iv.) Swine moved under this Article to a bacon-factory or slaughter-house shall be there detained until they are slaughtered ;
- (v.) A copy of every special authorisation for the use of any lairs, market, or saleyard shall forthwith be sent to the Board by the Local Authority granting the authorisation.

(2.) Before a licence (other than a licence authorising movement from any lairs, market, or saleyard) is granted by an Inspector under this Article the owner of the swine, or his agent authorised in writing for this purpose, shall sign, and deliver or send by post to the Inspector, a declaration (Form E) which shall be retained by the Inspector.

(3.) If any swine, other than swine moved under this Article into a Scheduled Area, are moved into any lairs, market, or saleyard while such premises are being used for the purposes of this Article, those swine shall be subject to the same restrictions as regards licences, marking, and movement, as swine moved under this Article into a Scheduled Area to such premises.

(4.) For the purposes of this Article the expressions 'market' and 'saleyard' shall include 'part of a market' and 'part of a saleyard.'

(5.) In the case of swine consigned from Ireland to any bacon-factory, slaughterhouse, lairs, market, or saleyard in a Scheduled Area, the licence authorising such movement required by this Article shall be

a licence signed by an Inspector or other officer duly authorised in that behalf by the Department of Agriculture and Technical Instruction for Ireland.

Cleansing and Disinfection of Lairs, Markets, and Saleyards.

6.—(1.) Any lairs, market, or saleyard used for the purposes of the preceding Article, shall, as soon as practicable after being used for such purposes, and before being again so used, be cleansed and disinfected as follows :

- (i.) The premises shall be thoroughly scraped or swept, and such parts thereof as permit of the same being effectually cleansed by washing shall be so cleansed ; and after such cleansing the premises shall be disinfected in manner prescribed by this Article.
- (ii.) All pens, hurdles, and fittings used in connection with the market or sale shall, as soon as practicable after being used for such purpose, and before being again so used, be cleansed by scraping and washing, and after such cleansing shall be disinfected in manner prescribed by this Article.
- (iii.) Any premises or thing required to be disinfected shall be thoroughly coated or washed with—
 - (a) a one per cent. (minimum) solution of chloride of lime containing not less than thirty per cent. of available chlorine ; or
 - (b) a five per cent. (minimum) solution of carbolic acid (containing not less than ninety-five per cent. of actual carbolic acid), followed by a thorough sprinkling with limewash ; or
 - (c) a disinfectant equal in disinfective efficiency to the above-mentioned solution of carbolic acid, followed by a thorough sprinkling with limewash.
- (iv.) The scrapings and sweepings shall forthwith be well mixed with quicklime and be effectually removed from contact with animals.

(2.) The cleansing and disinfection required by this Article shall, in the case of any lairs, market, or saleyard in the occupation of any person, be carried out by that person, and in any other case be carried out by the Local Authority of the District.

(3.) The Board may by licence modify the requirements of this Article in respect of any lairs, market, or saleyard.

Provision for Movement through Area.

7.—(1.) For the purposes of this Order, swine shall not be deemed to be moved into a Scheduled Area in any case where they are moved through the Scheduled Area by railway from a place outside the Scheduled Area to another place outside the Scheduled Area without

unnecessary delay and without the swine being untrucked within the Scheduled Area.

(2.) Swine shall not be deemed to be moved into a Scheduled Area, or along, over, or across a highway or thoroughfare in an Infected Area, where they are so moved for the sole purpose of transit to a place of destination outside that Area, provided that the movement is in accordance with the following conditions :

- (i.) During the movement the swine shall, except while being moved by railway or vessel, be conveyed in a float, cart, or van.
- (ii.) The swine shall not within the Area be removed from the float, van, or cart except for transit by railway or shipment, or be permitted to come in contact with other swine.
- (iii.) Where the movement is partly by railway or vessel and partly by road, the railway station or place of shipment at which the swine are to be removed from the float, cart, or van shall be specified in the licence, and the licence shall be available for transit by railway or vessel from such station or place only.
- (iv.) The swine shall be moved by the nearest available route and without unnecessary delay.
- (v.) The swine shall be accompanied by the licence (if any) authorising the movement granted under the preceding Articles of this Order, or if the movement is such that no such licence is required the swine shall be accompanied by a licence (Form F) authorising the movement which may be granted under this Article by an Inspector of the Local Authority of the District in which the railway station or place of shipment specified in the licence is situate, or if the movement is not to a railway station or place of shipment then by an Inspector of the District through which the swine enter the Area. In the case of movement from premises in an Infected Area, the licence shall only be granted on a Declaration (Form B).

Provision for Movement of Irish Swine through Scheduled Area.

8. Swine landed from Ireland at a port or place in a Scheduled Area shall not for the purposes of this Order be deemed to be moved into such Area, if they are consigned from Ireland to a place of destination outside the Scheduled Area, but swine so landed shall be moved from the landing-place forthwith by the most direct route to the nearest available railway station from which the swine can be moved to the place of destination to which they are so consigned, and forthwith moved by railway out of the Scheduled Area.

PART II.—INFECTED AREAS.

Regulation of Sales in Infected Area.

9. No market, fair or sale of swine shall be held in an Infected Area except a market or sale held in a market or saleyard specially authorised under Article 5 of this Order or a sale held in accordance with the following conditions :

- (i.) All the swine exposed at the sale must have been on the premises where the sale is held for a continuous period of twenty-eight days immediately before the date of the sale ; and no pig must have been moved on to those premises within such period, except swine moved temporarily therefrom for purposes of exhibition or moved for breeding, and the swine exposed at the sale must not within the said period have been in contact with any pig so moved on to the premises within such period ;
- (ii.) The swine must not be affected with swine-fever or have been exposed to the infection of swine-fever during the said period ; and
- (iii.) The sale must not be held in a Swine-Fever Infected Place, and the movement of the swine must not have been prohibited by Notice of an Inspector of a Local Authority or of the Board given under any Order of the Board.

Restriction on Movement of Swine in Infected Area.

10. Swine shall not be moved along, over, or across a highway or thoroughfare in an Infected Area, whether in a vehicle or not, for the purpose of movement to premises in the Area or outside the Area, unless they are accompanied by a licence authorising movement to such premises granted under this Order.

Movement of Swine with Licence.

11.—(1.) A licence obtained under Part I. of this Order authorising movement of swine shall be a sufficient authority under this Order for such movement along, over, or across a highway or thoroughfare in an Infected Area as is necessary for the movement authorised by the licence.

(2.) Where the proposed movement is not affected by Part I. of this Order a licence authorising the movement may be granted under and in accordance with one of the following provisions of this Article :

- (i.) A licence (Form A) may be granted by an Inspector of the Local Authority of the District in which the place of destination specified in the licence is situate. If the movement is from premises in an Infected Area, but not otherwise, the provisions of paragraphs (2) to (4) of Article 3 shall apply as if repeated in

this Article. The provisions of Article 4 shall apply with the necessary adaptations to swine moved with a licence under this provision.

- (ii.) A licence (Form D) may be granted on a Declaration (Form E) authorising movement of swine from premises, whether in an Infected Area or not, to a bacon-factory or slaughterhouse, or to any lairs, market or saleyard specially authorised by the Local Authority of the District under Article 5 of this Order. This licence shall be granted by an Inspector of the Local Authority of the District in which the premises are from which the swine are to be moved. Movement with a licence under this provision shall be subject to the conditions contained in Article 5, and the provisions of that Article shall apply accordingly, with the necessary adaptations, to swine moved with a licence under this Article.
- (iii.) A licence (Form F) may be granted on a Declaration (Form B) authorising movement of swine from premises in an Infected Area to the nearest available railway station for the purpose of transit to a place of destination which is not in a Scheduled Area. The licence under this provision shall be granted by an Inspector of the Local Authority of the District in which the railway station specified in the licence is situate.

(3.) A licence (Form A) granted under this Article, if expressly granted for the movement of swine for breeding purposes from any premises in an Infected Area to any other premises in that Infected Area, shall be available as a licence under this Order for the movement of the swine by the nearest available route and without unnecessary delay back to the premises from which they were moved under the licence: Provided that such movement shall take place within the six days or less period during which the licence is available.

(4.) A licence granted under this Article for movement from any premises for breeding purposes may be so granted without the prescribed declaration in any case in which the Inspector granting the same is satisfied that the pig since it was last returned to those premises after movement for breeding purposes has been kept separate from all other swine.

Straying of Swine on Highways.

12. No pig shall be allowed to stray on a highway or thoroughfare or on the sides thereof in an Infected Area.

Movement of Swine landed from Ireland in Infected Area.

13. Swine landed from Ireland at a port or place in an Infected Area may be moved free from any restrictions imposed by this Order from the landing-place forthwith by the most direct route to the nearest available railway station from which the swine can be moved to their place of destination.

PART III.—GENERAL.

Movement for Shipment.

14. Swine may be moved from premises in an Infected Area or Scheduled Area to any vessel for shipment, or to any premises in Great Britain for detention until shipment and thence to a vessel, if the swine during such movement are accompanied by a licence (Form F) authorising such movement, which may be granted on a Declaration (Form B) by an Inspector of the Local Authority of the District in which the premises are from which the swine are to be moved, but only if in his opinion the granting thereof is necessary or expedient.

Provision for Movement to and from Exhibitions.

15.—(1.) The restrictions on movement of swine imposed by this Order shall not apply to the movement of swine to any exhibition not in an Infected Area, which is held with a licence of the Local Authority of the District, or from any such exhibition to a place of destination in Great Britain, if the swine are accompanied by a licence (Form F) authorising such movement granted under this Article.

(2.) In the case of movement to the exhibition the licence shall be one granted by an Inspector of the Local Authority of the District in which such exhibition is held or by some person specially authorised by the said Local Authority, and in the case of movement from the exhibition the licence shall be one granted by an Inspector of the Local Authority of the District in which the place of destination is situate, and such place shall be specified in the licence.

Copies of Movement Licences to be sent to Local Authority of Place of Destination.

16. A copy of a licence which authorises movement of swine to premises in a District other than the District for which the person granting the licence acts as Inspector shall forthwith be sent by the Inspector to the Local Authority of the District in which the place of destination specified in the licence is situate.

Licences after Completion of Movement.

17.—(1.) Where swine are moved with a licence under this Order to any market, fair, saleyard, exhibition, or lairs, the licence shall be delivered up in exchange for the licence for movement of the swine from such premises.

(2.) Where swine are moved with a licence under this Order to any premises other than a market, fair, saleyard, exhibition, or lairs, the

licence shall forthwith after completion of the movement be delivered up at, or sent by post to, the nearest Police Station in the same District by the person in charge of the swine at the time of completing the said movement.

General Provisions as to Movement.

18.—(1.) Swine, while being moved under this Order, shall so far as is practicable be kept separate from all swine which are not being so moved, and shall be moved from the premises from which they are by the licence authorised to be moved by the nearest available route and without unnecessary delay to the place of destination specified in the licence, and not elsewhere.

(2.) No licence granted under this Order shall have the effect of authorising movement of swine which are in a Swine-Fever Infected Place or of swine the movement of which is prohibited by notice served by an Inspector of a Local Authority or of the Board under any Order of the Board.

Provisions as to Local Regulations.

19. Regulations made by the Local Authority of any District comprised in a Scheduled Area as to movement into or within their District shall not apply to any movement of swine authorised by a licence under this Order.

Production of Licences; Names and Addresses.

20.—(1.) Any person in charge of a pig being moved, where under this Order a licence is necessary, shall, on demand of a Justice, or of a constable, or of an Inspector or other officer of the Board or of a Local Authority, produce and show to him the licence, if any, authorising the movement, and shall allow it to be read and a copy of or extract from it to be taken by the person to whom it is produced.

(2) Any person so in charge shall, on demand as aforesaid, give his name and address to the Justice, or constable, or Inspector or other officer.

Local Authority to enforce Order.

21. The provisions of this Order shall be executed and enforced by the Local Authority.

Duration of Movement Licences.

22. Movement licences granted under this Order shall, except where otherwise expressly provided, be available only for six days including the day of the date thereof or such less time as may be specified in the licence.

Granting of Movement Licences.

23.—(1.) A movement licence granted under this Order shall not be available if granted by the owner of the swine to be moved, or by his agent, or by the consignee of the swine, or by the occupier of the farm or premises or slaughterhouse from or to which the swine are to be moved, or by any individual member of an Executive Committee or Sub-Committee of a Local Authority.

(2.) A movement licence shall not be granted by an Inspector if, in his opinion, it is undesirable to grant it.

Forms.

24. Declarations and Licences required or authorised by this Order shall be in the Forms set forth in the First Schedule hereto or to the like effect.

Offences.

25.—(1.) If a pig is moved in contravention of this Order, the owner of the pig, and the person for the time being in charge thereof, and the person causing, directing, or permitting the movement, and the person moving or conveying the pig, and the consignee or other person receiving or keeping it knowing it to have been moved in contravention as aforesaid, and the occupier of the place from which the pig is moved, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

(2.) If a person in charge of a pig being moved, where under this Order a licence is necessary, on demand made under this Order, fails to give his true name and address, or gives a false name or address, he shall be deemed guilty of an offence against the Act of 1894.

(3.) If any person fails to deliver up or send a licence, as required by this Order, he shall be deemed guilty of an offence against the Act of 1894.

(4.) If a pig is not isolated as required by this Order, the owner of the pig, and the person for the time being in charge thereof, and the occupier of the place where the pig is detained, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

(5.) If any person, with a view unlawfully to evade or defeat the operation of this Order, by washing, or in any other manner, takes out, effaces, or obliterates, or attempts to take out, efface, or obliterate, any mark painted on any pig for the purposes of this Order, the person doing the same, and the person causing, directing, or permitting the same to be done, and the owner of the pig, and the person for the time being in charge thereof, shall, each according to and in respect of

his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

(6.) If any person in contravention of this Order allows a pig to stray, he shall be deemed guilty of an offence against the Act of 1894.

(7.) If anything is omitted to be done as regards cleansing or disinfecting in contravention of this Order, the occupier of any place in or in respect of which the same is omitted shall, according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

Interpretation.

26. In this Order, unless the context otherwise requires—

‘Bacon-factory’ means premises in which the business of a curer of bacon is carried on :

‘Slaughterhouse’ means any premises where animals are habitually slaughtered :

‘Person’ includes any body of persons corporate or unincorporate :

‘Inspector’ includes Veterinary Inspector :

‘The Board’ means the Board of Agriculture and Fisheries :

‘The Act of 1894’ means the Diseases of Animals Act, 1894.

Other terms have the same meaning as in the Act of 1894.

Revocation of Orders.

27. From and after the commencement of this Order the Orders described in the Second Schedule hereto are hereby revoked : Provided that every Scheduled Area to which the Swine-Fever (Regulation of Movement) Order of 1903 applies at the date of the revocation shall thereupon become a Scheduled Area for the purposes of this Order, and any Area which at the date of such revocation is a Swine-Fever Infected Area shall thereupon become an Infected Area for the purposes of this Order, and any licence of the Board modifying the requirements of Article 6 of the Swine-Fever (Regulation of Movement) Order of 1903 shall modify the requirements of Article 6 of this Order.

Commencement.

28. The Order shall come into operation on the first day of June, nineteen hundred and eight.

Short Title.

29. This Order may be cited as the SWINE-FEVER (REGULATION OF MOVEMENT) ORDER OF 1908.

FIRST SCHEDULE.

FORM A.

(Articles 3 and 11.)

DISEASES OF ANIMALS ACTS.

SWINE-FEVER
(REGULATION OF
MOVEMENT) ORDER
OF 1908.

SWINE-FEVER (REGULATION OF MOVEMENT)
ORDER OF 1908.

*Movement Licence for
use under Articles
3 and 11.*

Movement Licence for use under Articles 3 and 11.

* Here add,

*'Movement for
breeding purposes,' if
the Licence is granted
for such purposes; the
addition to be initi-
ated by the person
granting the Licence.*

Licence No.

Licence [granted
on the Declaration
of
for movement of
swine from
to

Name and address
of Licensee

Number of swine

Description

(Signed)

(Dated) 19 .

This Licence is
available for *Six*
days.

This counterfoil is
to be retained by the
person granting the
Licence.

A copy of this
Licence must forth-
with be sent to the
Local Authority of
the District in which
is situate the place
to which the swine
are to be moved, if
Inspector does not
act for that District.

*

No. .

I, the undersigned, being an Inspector of the
Local Authority of the [county] of
do hereby license movement of the undermentioned
swine from the premises described in Column III. to
the place of destination specified in Column IV.

COLUMN I.	COLUMN II.	COLUMN III.	COLUMN IV.
Name and address of person to whom this Licence is granted.	Number and description of swine to be moved.	Name or description of place and premises from which swine are to be moved, stating District of Local Authority in which situate.	Name or description of place and premises to which swine are to be moved, stating District of Local Authority in which situate.

This Licence is available for *Six* days, including
the day of the date hereof, and no longer.

If this Licence is expressly granted for movement
for breeding purposes it is available for the double
movement, namely,—from the premises described in
Column III. to the premises described in Column IV.
and back to the premises described in Column III. :
Provided that both movements must take place
within the time during which this Licence is avail-
able, and both premises must be in the same Swine-
Fever Infected Area.

This Licence does not authorise movement of
swine which are in a Swine-Fever Infected Place or
of swine the movement of which is prohibited by
notice given by an Inspector of a Local Authority or
of the Board of Agriculture and Fisheries under any
Order of the Board.

Dated this day of 19 .

(Signed) _____

To be printed as Indorsement on Licence (Form A).

The Swine-Fever (Regulation of Movement) Order of 1908 contains provisions to the following effect :

The swine must be accompanied by this Licence, and be moved by the nearest available route and without unnecessary delay. The swine must be moved to the place of destination specified in this Licence and not elsewhere.

The movement of the swine is not subject to any Regulation made by a Local Authority of any District in a Swine-Fever Scheduled Area for prohibiting or regulating the movement of swine.

The swine must not, for a period of twenty-eight days after arrival at the place of destination specified herein, be moved therefrom, except as provided by the Order. The swine, while so detained, must be kept separate from all other swine. This does not apply to movement within an Infected Area for purposes of breeding.

Where the swine are moved with this Licence to a market, fair or saleyard, the swine may be moved from such premises only if accompanied by a Licence authorising such movement granted by an Inspector of the Local Authority of the District in which the market, fair or saleyard is situate and only to a bacon-factory or slaughterhouse specified in the Licence, where the swine after their arrival shall be detained until they are slaughtered, or to the premises from which the swine were moved to the market, fair, or saleyard. In the latter case the Order requires detention and isolation of the swine.

Where the swine are moved with this Licence to any market, fair, saleyard, exhibition, or lairs, the Licence must be delivered up in exchange for the Licence for movement of the swine from such premises.

Where the swine are moved with this Licence to any premises other than a market, fair, saleyard, exhibition, or lairs, the Licence must forthwith after completion of the movement be delivered up at, or sent by post to, the nearest Police Station in the same District by the person in charge of the swine at the time of completing the said movement.

This Licence is not available if it is granted by the owner of the swine to be moved, or by his agent, or by the consignee of the swine, or by the occupier of the farm or premises or slaughterhouse from or to which the swine are to be moved, or by any individual member of an Executive Committee or Sub-Committee of a Local Authority.

Caution.—Persons acting without a Licence where a Licence is necessary, or acting thereon after the Licence has expired, or counterfeiting, fabricating, or altering, or obtaining or endeavouring to obtain a Licence by means of a false pretence, or granting or issuing a Licence knowing the same to be false in any respect, or committing other offence with respect to a Licence, are liable, under the Diseases of Animals Act, 1894, to fine and imprisonment.

FORM B.

(Articles 3, 7, 11, and 14.)

DISEASES OF ANIMALS ACTS.

SWINE-FEVER (REGULATION OF MOVEMENT) ORDER OF 1908.

Declaration for use in case of Movement of Swine not Marked for Slaughter.

I, A.B., of _____, in the [county] of _____, do hereby solemnly and sincerely declare—

- (a) that I am the owner of [or the agent authorised in writing for this purpose by A.B. the owner of] the undermentioned swine;
- (b) ¹that the swine to be moved have been on the premises from which they are to be moved for a continuous period of twenty-eight days immediately before the date of this Declaration, and during such period have not been in contact with any pig that has been moved on to those premises within such period;
- (b b) ²that the swine to be moved have been on the premises from which they are to be moved for a continuous period of twenty-eight days immediately before the date of this Declaration; that no pig has been moved on to those premises within such period ³*except swine moved temporarily therefrom for purposes of exhibition or moved for breeding; and that the swine to be moved have not within the said period been in contact with any pig so moved on to the premises within such period;*
- (c) that to the best of my knowledge and belief the swine are not affected with swine-fever, and have not during the period of twenty-eight days as aforesaid been in any way exposed to the infection of swine-fever; and
- (d) that the swine are not in a Swine-Fever Infected Place and their movement is not prohibited by Notice of an Inspector or Officer of a Local Authority or of the Board of Agriculture and Fisheries given under any Order of the Board.
- (e) ⁴*that the swine are to be moved for breeding purposes, and for no other purpose.*

Dated this _____ day of _____, 19 ____.

(Signed) _____

¹ Strike out (b) if movement is from premises in an Infected Area.

² Strike out (b b) if movement is from premises not in an Infected Area.

³ Strike out words in italics if no pig has been moved on within the 28 days.

⁴ Strike out (e) if the movement is not for breeding purposes.

Number and description of swine to be moved.	Name or description of place and premises from which swine are to be moved, stating District of Local Authority in which situate.	Place of destination, stating name or description of place and premises to which swine are to be moved, and stating District of Local Authority in which situate.

Note.—This Declaration is to be retained by the person granting the Licence.

SWINE-FEVER (REGULATION OF MOVEMENT) ORDER OF 1908.

Counterfoil to be printed at foot of Declaration and to be retained by the Police Officer of the District where the swine are who countersigns the Declaration as required by the Order.

Date of Declaration.	Name and address of person making Declaration. If an agent, add name and address of owner.	Number and description of swine to be moved.	Name or description of place and premises from which swine are to be moved, stating District of Local Authority in which situate.	Place of destination, stating name or description of place and premises to which swine are to be moved, and stating District of Local Authority in which situate.

FORM C.

(Article 4.)

SWINE-FEVER
(REGULATION OF
MOVEMENT) ORDER
OF 1908.

*Movement Licence
for use under
Article 4.*

Licence No.

Licence granted
for movement of
swine from

to

Name and address
of Licensee

Number of swine

Description

(Signed)

(Dated) 19 .

This Licence is
available for *Six*
days.

This counterfoil is
to be retained by the
person granting the
Licence.

A copy of this
Licence must forth-
with be sent to the
Local Authority of
the District in which
is situate the place
to which the swine
are to be moved, if
Inspector does not
act for that District.

DISEASES OF ANIMALS ACTS.

SWINE-FEVER (REGULATION OF MOVEMENT)
ORDER OF 1908.

Movement Licence for use under Article 4.

No. .

I, the undersigned, being an Inspector of the
Local Authority of the [county] of
do hereby license movement of the undermentioned
swine from the premises described in Column III.
to the place of destination specified in Column IV.

COLUMN I.	COLUMN II.	COLUMN III.	COLUMN IV.
Name and address of person to whom this Licence is granted.	Number and description of swine to be moved.	Name or description of place and premises from which swine are to be moved, stating District of Local Authority in which situate.	Name or description of place and premises to which swine are to be moved, stating District of Local Authority in which situate.

This Licence is available for *Six* days, including
the day of the date hereof, and no longer.

This Licence must forthwith after completion of
the movement be delivered up at, or sent by post to,
the nearest Police Station in the same District by
the person in charge of the swine at the time of
completing the said movement.

Swine moved under this Licence are subject to
detention at the place of destination as provided by
the Order.

Dated this day of 19 .

(Signed) _____

FORM D.

(Articles 5 and 11.)

SWINE-FEVER
(REGULATION OF
MOVEMENT) ORDER
OF 1908.

*Movement Licence
for Swine required
to be marked for
Slaughter.*

Licence No.

Licence [granted
on the Declaration
of

] for movement of
swine from

to

Name and address
of Licensee

Number of swine

Description

(Signed)

(Dated) 19 .

This Licence is
available for *Six*
days.

This counterfoil is
to be retained by the
person granting the
Licence.

A copy of this
Licence must forth-
with be sent to the
Local Authority of
the District in which
is situate the place
to which the swine
are to be moved, if
Inspector does not
act for that District.

DISEASES OF ANIMALS ACTS.

SWINE-FEVER (REGULATION OF MOVEMENT)
ORDER OF 1908.

*Movement Licence for Swine required to be marked
for Slaughter.*

No. .

I, the undersigned, being an Inspector of the
Local Authority of the [county] of
, do hereby license movement of the
undermentioned swine from the premises described
in Column III. to the place of destination specified
in Column IV.

COLUMN I.	COLUMN II.	COLUMN III.	COLUMN IV.
Name and address of person to whom this Licence is granted.	Number and description of swine to be moved.	Name or description of place and premises from which swine are to be moved, stating District of Local Authority in which situate.	Name or description of place and premises to which swine are to be moved, stating District of Local Authority in which situate.

This Licence is available for *Six* days, including
the day of the date hereof, and no longer.

This Licence does not authorise movement of
swine which are in a Swine-Fever Infected Place or
of swine the movement of which is prohibited by
notice given by an Inspector of a Local Authority or
of the Board of Agriculture and Fisheries under any
Order of the Board.

Dated this day of 19 .

(Signed) _____

[Read the Notice on back of this Licence.]

To be printed as Indorsement on Licence (Form D).

The Swine-Fever (Regulation of Movement) Order of 1908 in relation to the movement of swine marked for slaughter provides, in effect, as follows:—

The swine must be accompanied by this Licence, and be moved by the nearest available route and without unnecessary delay. The swine must be moved to the place of destination specified in this Licence and not elsewhere.

The movement of the swine is not subject to any Regulation made by a Local Authority for prohibiting or regulating the movement of swine.

The swine shall be marked by and at the expense of the owner by the painting with an indelible composition of red colour of a broad line down the back and another broad line across the loins of each of the swine thus +, each line being not less than nine inches long.

During the movement the swine must, except while being moved by railway or vessel, be conveyed in a float, cart or van, and the swine must not be permitted to come in contact with swine not so marked.

The swine can be moved from the market, saleyard or lairs only to a bacon-factory or slaughterhouse.

The swine, after their arrival at the bacon-factory or slaughterhouse specified in this Licence, must be there detained until they are slaughtered.

Where the swine are moved with this Licence to any market, saleyard or lairs, the Licence must be delivered up in exchange for the Licence for movement of the swine from such premises.

Where swine are moved with a Licence to any premises other than a market, saleyard, or lairs, the Licence must forthwith after completion of the movement be delivered up at, or sent by post to, the nearest Police Station in the same District by the person in charge of the swine at the time of completing the said movement.

This Licence is not available if it is granted by the owner of the swine to be moved, or by his agent, or by the consignee of the swine, or by the occupier of the farm or premises or slaughterhouse from or to which the swine are to be moved, or by any individual member of an Executive Committee or Sub-Committee of a Local Authority.

Caution.—Persons acting without a Licence where a Licence is necessary, or acting thereon after the Licence has expired, or counterfeiting, fabricating, or altering, or obtaining or endeavouring to obtain a Licence by means of a false pretence, or granting or issuing a Licence knowing the same to be false in any respect, or committing other offence with respect to a Licence, are liable, under the Diseases of Animals Act, 1894, to fine and imprisonment.

FORM E.

(Articles 5 and 11.)

DISEASES OF ANIMALS ACTS.

SWINE-FEVER (REGULATION OF MOVEMENT) ORDER OF 1908.

Declaration for use in case of Movement of Swine marked for Slaughter.

I, A.B., of _____, in the [county] of _____, do hereby solemnly and sincerely declare—

- (a) that I am the owner of [or the agent authorised in writing for this purpose by A.B. the owner of] the undermentioned swine;
- (b) that to the best of my knowledge and belief the swine are not affected with swine-fever, and have not been in any way exposed to the infection of swine-fever during the last twenty-eight days; and
- (c) that the swine are not in a Swine-Fever Infected Place, and that the movement of the swine is not prohibited by Notice of an Inspector of a Local Authority or of the Board of Agriculture and Fisheries given under any Order of the Board.

Dated this _____ day of _____, 19 .

(Signed) _____

Number and description of swine to be moved.	Name or description of place and premises from which swine are to be moved, stating District of Local Authority in which situate.	Place of destination, stating name or description of place and premises to which swine are to be moved, and stating District of Local Authority in which situate

Note.—This Declaration is to be retained by the person granting the Licence.

FORM F.

Articles 7, 11, 14, and 15.)

SWINE-FEVER
(REGULATION OF
MOVEMENT) ORDER
OF 1908.*Movement Licence for
use under Articles
7, 11, 14, and 15.*

Licence No.

Licence [granted
on the Declaration
of] for movement of
swine from

to

Name and address
of Licensee.

Number of swine

Description

(Signed)

(Dated) 19 .

This Licence is
available for *Six*
days.This counterfoil is
to be retained by the
person granting the
Licence.A copy of this
Licence must forth-
with be sent to the
Local Authority of
the District in which
is situate the place
to which the swine
are to be moved, if
Inspector does not
act for that District.

DISEASES OF ANIMALS ACTS.

SWINE-FEVER (REGULATION OF MOVEMENT)
ORDER OF 1908.*Movement Licence for use under Articles 7, 11, 14,
and 15.*

No. .

I, the undersigned, being an Inspector of the
Local Authority of the [county] of
do hereby license movement of the undermentioned
swine from the premises described in Column III. to
the place of destination specified in Column IV.

COLUMN I.	COLUMN II.	COLUMN III.	COLUMN IV.
Name and address of person to whom this Licence is granted.	Number and description of swine to be moved.	Name or description of place and premises from which swine are to be moved, stating District of Local Authority in which situate.	Name or description of place and premises to which swine are to be moved, stating District of Local Authority in which situate.

This Licence is available for *Six* days, including
the day of the date hereof, and no longer.This Licence does not authorise movement of
swine which are in a Swine-Fever Infected Place,
or of swine the movement of which is prohibited
by notice given by an Inspector of a Local Authority
or of the Board of Agriculture and Fisheries under
any Order of the Board.

Dated this day of 19 .

(Signed) _____

SECOND SCHEDULE.

Orders Revoked.

(Article 27.)

No.	Date.	Short Title.
6526	1902. 20 September	The Swine-Fever (Infected Areas) Order of 1902.
6734	1903. 2 September	The Swine-Fever (Regulation of Movement) Order of 1903.

(6866.)

ORDER OF THE BOARD OF AGRICULTURE AND FISHERIES.

(DATED 22ND NOVEMBER 1904.)

SWINE-FEVER (MOVEMENT FROM IRELAND)
ORDER OF 1904.¹

The Board of Agriculture and Fisheries, by virtue and in exercise of the powers in them vested under the Diseases of Animals Acts, 1894 to 1903, and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows :

Restriction on Landing of Irish Swine.

1. Swine brought from Ireland shall not be landed in Great Britain except in accordance with the provisions of this Order.

Special Provision for Landing for Immediate Slaughter.

2.—(1.) Swine brought from Ireland may be landed in Great Britain for the purpose of movement to a particular bacon-factory or slaughter-house, or to any particular lairs, market, or saleyard specially authorised to be used for such purpose by the Local Authority of the district, if accompanied by a licence authorising such landing and movement granted by an Inspector or other officer duly authorised in that behalf by the Department of Agriculture and Technical Instruction for Ireland, and subject to the following conditions, namely :

- (i.) The swine shall, before being landed, be marked by and at the expense of the owner by the painting with an indelible composition of red colour of a broad line down the back and another

¹ This Order is modified by the Swine-Fever (Movement from Ireland) Order of 1906.

broad line across the loins of each of the swine, thus +, each line being not less than nine inches long ;

- (ii.) The swine when landed shall be moved, by railway so far as is practicable, to the place of destination specified in the licence, and during such movement shall not be permitted to come in contact with swine not marked under this Article ;
- (iii.) Swine moved under this Article to any lairs, market, or saleyard shall be moved therefrom only if accompanied by a licence authorising such movement granted by an Inspector of the Local Authority of the district in which the lairs, market, or saleyard may be situate and only to a bacon-factory or slaughterhouse specified in the licence, and such movement shall be subject to the conditions of this Article as to marking and movement ; and
- (iv.) Swine moved under this Article to a bacon-factory or slaughterhouse shall after their arrival thereat be there detained until they are slaughtered.

(2.) A copy of every special authority for the use of any lairs, market, or saleyard shall be forthwith sent to the Board by the Local Authority granting the authority.

(3.) If any swine, other than swine moved under this Article, are moved into any lairs, market, or saleyard while such premises are being used for the purposes of this Article, those swine shall be subject to the same restrictions as regards licences, marking, and movement, as swine moved under this Article to such premises.

(4.) For the purposes of this Article the expressions 'market' and 'saleyard' shall include 'part of a market' and 'part of a saleyard.'

Cleansing and Disinfection of Lairs, Markets, and Saleyards.

3.—(1.) Any lairs, market, or saleyard used for the purposes of the preceding Article, shall, as soon as practicable after being used for such purposes, and before being again so used, be cleansed and disinfected as follows :

- (i.) The premises shall be thoroughly scraped or swept, and such parts thereof as permit of the same being effectually cleansed by washing shall be so cleansed ;
- (ii.) After such cleansing the premises shall be thoroughly sprinkled with a solution of carbolic acid and limewash containing not less than five per cent. of actual carbolic or cresylic acid ;
- (iii.) All pens, hurdles and fittings shall, as soon as practicable after being used for such purposes, and before being again so used, be cleansed by scraping and washing, and after such

cleansing shall be thoroughly sprinkled with a solution of carbolic acid and limewash as prescribed above; and

- (iv.) The scraping and sweepings shall forthwith be well mixed with quicklime and be effectually removed from contact with animals.

(2.) The cleansing and disinfection required by this Article shall, in the case of any lairs, market, or saleyard in the occupation of any person, be carried out by that person, and in any other case be carried out by the Local Authority of the district.

(3.) The Board may by licence modify the requirements of this Article in respect of any lairs, market, or saleyard.

Provisions as to Licences for Movement.

4.—(1.) Where swine are moved with a licence under this Order to any lairs, market, or saleyard, the licence shall be delivered up in exchange for the licence for movement of the swine from such premises.

(2.) Where swine are moved with a licence under this Order to any bacon-factory or slaughterhouse the licence shall forthwith after completion of the movement be delivered up at, or sent by post to, the nearest Police Station in the same district by the person in charge of the swine at the time of completing the said movement.

(3.) A copy of a licence for movement from any lairs, market, or saleyard, shall be sent by the Inspector granting the same to the Local Authority of the district in which is situate the bacon-factory or slaughterhouse specified in the licence.

General Provisions as to Movement.

5.—(1.) Swine, while being moved under this Order, shall so far as is practicable be kept separate from all other swine, and shall be moved by the nearest available route and without unnecessary delay to the place of destination specified in the licence, and not elsewhere.

(2.) Swine moved with a licence under this Order shall not, unless otherwise hereafter expressly provided by Order of the Board, be subject to any restriction on movement of swine imposed by Order of the Board or by regulations made by the Local Authority of any district.

Production of Licences; Names and Addresses.

6.—(1.) Any person in charge of a pig being landed or moved, where under this Order a licence is necessary, shall, on demand of an officer of Customs or of a Justice, or of a constable, or of an Inspector or other officer of the Board or of a Local Authority, produce and show to him the licence, if any, authorising the landing

or movement, and shall allow it to be read and a copy of or extract from it to be taken by the person to whom it is produced.

(2.) Any person so in charge shall, on demand by any such person as aforesaid, give to him his name and address.

Local Authority to enforce Order.

7. The provisions of this Order shall be executed and enforced in Great Britain by the Local Authority.

Offences.

8.—(1.) If a pig is landed or moved in contravention of this Order, the owner of the pig, and the person for the time being in charge thereof, and the person causing, directing, or permitting the landing or movement, and the person landing or moving or conveying the pig, and the consignee or other person receiving or keeping it knowing it to have been landed or moved in contravention as aforesaid, and the occupier of the place from which the pig is so moved, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

(2.) If a person in charge of a pig being landed or moved, where under this Order a licence is necessary, on demand made under this Order, fails to give his true name and address, or gives a false name or address, he shall be deemed guilty of an offence against the Act of 1894.

(3.) If any person fails to deliver up or send a licence, as required by this Order, he shall be deemed guilty of an offence against the Act of 1894.

(4.) If a pig is not marked, or is not isolated, as required by this Order, the owner, consignee, or other person for the time being in charge thereof, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

(5.) If any person, with a view unlawfully to evade or defeat the operation of this Order, by washing, or in any other manner, takes out, effaces, or obliterates, or attempts to take out, efface, or obliterate, any mark painted on any pig as required by this Order, the person doing the same, and the person causing, directing, or permitting the same to be done, and the owner of the pig, and the person for the time being in charge thereof, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

(6.) If anything is omitted to be done as regards cleansing or disinfection in contravention of this Order, the occupier of any place in or in respect of which the same is omitted shall, according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

Interpretation.

9. In this Order, unless the context otherwise requires—

- ‘Bacon-factory’ means premises in which the business of a curer of bacon is carried on :
- ‘Slaughterhouse’ means any premises where animals are habitually slaughtered :
- ‘Person’ includes any body of persons corporate or unincorporate :
- ‘Inspector’ includes Veterinary Inspector :
- ‘The Board’ means the Board of Agriculture and Fisheries :
- ‘The Act of 1894’ means the Diseases of Animals Act, 1894.

Revocation.

10. The Swine-Fever (Movement from Ireland) Temporary Order of 1894 and every Order extending the operation of such Order and all regulations made under any such Order shall be revoked and cease to operate as from the commencement of this Order.

Commencement.

11. This Order shall come into operation on the twenty-third day of January, nineteen hundred and five.

Short Title.

12. This Order may be cited as the SWINE-FEVER (MOVEMENT FROM IRELAND) ORDER OF 1904.

(7020.)

ORDER OF THE BOARD OF AGRICULTURE AND FISHERIES.

(DATED 26TH JANUARY 1906.)

SWINE-FEVER (MOVEMENT FROM IRELAND)
ORDER OF 1906.

The Board of Agriculture and Fisheries, by virtue and in exercise of the powers vested in them under the Diseases of Animals Acts, 1894 to 1903, and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows :

Modification of Swine-Fever (Movement from Ireland).

Order of 1904.

1. The Swine-Fever (Movement from Ireland) Order of 1904, which restricts the landing in Great Britain of swine brought from Ireland and regulates the movement of swine so landed, is modified by this Order in manner hereinafter appearing.

Provision for Landing of Store Swine.

2. Swine brought from Ireland may be landed in Great Britain and moved from the place of landing to premises in Great Britain with a view to detention on such premises in accordance with Article 4 of this Order, if accompanied by a licence authorising such landing and movement granted by an Inspector or other officer duly authorised in that behalf by the Department of Agriculture and Technical Instruction for Ireland, and subject to the following conditions, namely :

- (i.) Every application for a licence under this Article shall be accompanied by—
 - (a) a declaration in the Form A set forth in the Schedule to this Order or to the like effect signed by the occupier of the premises where the swine to which the application relates have been kept, and countersigned by a member of the Police force of the District in which such premises are situate ; and
 - (b) a declaration in the Form B set forth in the said Schedule or to the like effect signed by the applicant for the licence.
- (ii.) A licence shall become void if the swine to which it relates are during the voyage to Great Britain permitted to come in contact with swine which are not accompanied by a licence under this Order.
- (iii.) The licence shall forthwith after completion of the movement be delivered up at, or sent by post to, the nearest Police Station in the same District by the person in charge of the swine at the time of completing the said movement.

General Provisions as to Movement.

3.—(1.) Swine, while being moved under this Order, shall so far as is practicable be kept separate from all swine which are not accompanied by a licence under this Order, and shall be moved by the nearest available route, and by railway so far as is practicable, and without unnecessary delay, to the place of destination specified in the licence, and not elsewhere.

(2.) Swine while being moved under this Order shall not, unless otherwise hereafter expressly provided by Order of the Board of Agriculture and Fisheries, be subject to any restriction on movement of swine imposed by Order of the Board or by regulations made by the Local Authority of any District.

Detention and Isolation after Arrival at Destination.

4.—(1.) Swine moved with a licence under this Order shall not, for a period of twenty-eight days after arrival at the place of destination

specified in the licence, be moved from such place of destination.

(2.) Swine, while detained under this Article, shall be kept separate from all other swine. This provision does not restrict the removal of any carcase of a pig.

Production of Licences ; Names and Addresses.

5.—(1.) Any person in charge of a pig being landed or moved, where under this Order a licence is necessary, shall, on demand of an officer of Customs or of a Justice, or of a constable, or of an Inspector or other officer of the Board of Agriculture and Fisheries or of a Local Authority, produce and show to him the licence, if any, authorising the landing or movement, and shall allow it to be read and a copy of or extract from it to be taken by the person to whom it is produced.

(2.) Any person so in charge shall, on demand by any such person as aforesaid, give to him his name and address.

Local Authority to enforce Order.

6. The provisions of this Order shall be executed and enforced in Great Britain by the Local Authority.

Offences.

7.—(1.) If a pig is landed or moved in contravention of this Order, the owner of the pig, and the person for the time being in charge thereof, and the person causing, directing, or permitting the landing or movement, and the person landing or moving or conveying the pig, and the consignee or other person receiving or keeping it knowing it to have been landed or moved in contravention as aforesaid, and the occupier of the place from which the pig is so moved, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Diseases of Animals Act, 1894.

(2.) If a person in charge of a pig being landed or moved, where under this Order a licence is necessary, on demand made under this Order, fails to give his true name and address, or gives a false name or address, he shall be deemed guilty of an offence against the Diseases of Animals Act, 1894.

(3.) If a pig is not isolated as required by this Order, the owner, consignee, or other person for the time being in charge thereof, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Diseases of Animals Act, 1894.

(4.) If any person fail to deliver up or send a licence, as required by this Order, he shall be deemed guilty of an offence against the Diseases of Animals Act, 1894.

Commencement.

8. This Order shall come into operation on the first day of March, nineteen hundred and six.

Short Title.

9. This Order may be cited as the SWINE-FEVER (MOVEMENT FROM IRELAND) ORDER OF 1906.

SCHEDULE.

FORM A.

(Article 2.)

(Form of Declaration by Occupier of Premises where Swine are kept.)

I, A.B., do solemnly and sincerely declare as follows:—

- (a) That I am the occupier of the undermentioned premises;
- (b) That the undermentioned swine are now on those premises and have been thereon for a period of at least twenty-eight days immediately before the date of this declaration;
- (c) That to the best of my knowledge and belief those swine are not affected with swine-fever and have not during the period of twenty-eight days as aforesaid been in any way exposed to the infection of swine-fever; and
- (d) That those swine are not in a Swine-Fever Infected Place, and that the movement of those swine is not prohibited by notice of an Inspector of a Local Authority, or of the Department of Agriculture and Technical Instruction for Ireland, given under any Order of that Department.

Dated this day of , 19 .

(Signed) _____

Number and Description of Swine.	Name or Description of Place and Premises where the Swine are, stating the District of the Local Authority in which situate.

I, being duly authorised, do hereby countersign the above Declaration.

Signature and rank of Police Officer
Police Sub-District

Caution.—A person making a Declaration false in any material particular is liable under the Diseases of Animals Act, 1894, to fine and imprisonment.

FORM B.

(Article 2.)

(Form of Declaration by Applicant for Licence.)

I, C.D., of _____ in the [county] of _____, do hereby solemnly and sincerely declare as follows:—

- (a) That to the best of my knowledge and belief the swine referred to in application No. _____ are the swine referred to in the declaration[s] hereto annexed;
- (b) That to the best of my knowledge and belief those swine, since they were moved from the premises specified in the declaration[s] hereto annexed, have not been exposed in any market, fair, or sale-yard, or been in contact with any swine other than those to which that application relates.

Dated this _____ day of _____, 19 ____.

(Signed)_____

Caution.—A person making a declaration false in any material particular is liable, under the Diseases of Animals Act, 1894, to fine and imprisonment.

(7636.)

ORDER OF THE BOARD OF AGRICULTURE AND FISHERIES.

(DATED 19TH JANUARY 1909.)

SWINE-FEVER (MOVEMENT FROM ISLE OF MAN)
ORDER OF 1909.

The Board of Agriculture and Fisheries, by virtue and in exercise of the powers vested in them under the Diseases of Animals Acts, 1894 to 1903, and of every other power enabling them in this behalf, do order, and it is hereby ordered, as follows:

Restriction on Landing of Swine.

1. Swine brought from the Isle of Man shall not be landed in Great Britain except in accordance with the provisions of this Order.

Special Provision for Landing for Immediate Slaughter.

2. Swine brought from the Isle of Man may be landed in Great Britain for the purpose of movement to a particular bacon-factory or slaughterhouse, or to any particular lairs, market, or saleyard specially authorised by the Local Authority under the Swine-Fever (Regulation of Movement) Order of 1908 or under the Swine-Fever (Movement from Ireland) Order of 1904, if accompanied by a licence authorising such landing and movement granted by an Inspector or

other officer duly authorised in that behalf by the Lieutenant-Governor of the Isle of Man, and subject to the following conditions, namely :

- (i.) The swine shall, before being landed, be marked by and at the expense of the owner by the painting with an indelible composition of red colour of a broad line down the back and another broad line across the loins of each of the swine, thus +, each line being not less than nine inches long ;
- (ii.) The swine when landed shall be moved, by railway so far as is practicable, to the place of destination specified in the licence, and during such movement shall not be permitted to come in contact with swine not marked under this Article ;
- (iii.) Swine moved under this Article to any lairs, market, or saleyard can, by reason of the above-mentioned Orders, be moved therefrom to a bacon-factory or slaughterhouse only ; and
- (iv.) Swine moved under this Article to a bacon-factory or slaughterhouse shall be there detained until they are slaughtered.

Provisions as to Licences for Movement.

3.—(1.) Where swine are moved with a licence under this Order to any lairs, market, or saleyard, the licence shall be delivered up in exchange for the licence for movement of the swine from such premises.

(2.) Where swine are moved with a licence under this Order to any bacon-factory or slaughterhouse the licence shall forthwith after completion of the movement be delivered up at, or sent by post to, the nearest Police Station in the same district by the person in charge of the swine at the time of completing the said movement.

General Provisions as to Movement.

4.—(1.) Swine, while being moved under this Order, shall so far as is practicable be kept separate from all other swine, and shall be moved by the nearest available route and without unnecessary delay to the place of destination specified in the licence, and not elsewhere.

(2.) Swine, while being moved with a licence under this Order, shall not, unless otherwise hereafter expressly provided by Order of the Board, be subject to any restriction on movement of swine imposed by Order of the Board or by regulations made by the Local Authority of any District.

Production of Licences ; Names and Addresses.

5.—(1.) Any person in charge of a pig being landed or moved, where under this Order a licence is necessary, shall, on demand of an officer of Customs or of a Justice, or of a constable, or of an Inspector or

other officer of the Board or of a Local Authority, produce and show to him the licence, if any, authorising the landing or movement, and shall allow it to be read and a copy of or extract from it to be taken by the person to whom it is produced.

(2.) Any person so in charge shall, on demand by any such person as aforesaid, give to him his name and address.

Local Authority to enforce Order.

6. The provisions of this Order shall be executed and enforced in Great Britain by the Local Authority.

Offences.

7.—(1.) If a pig is landed or moved in contravention of this Order, the owner of the pig, and the person for the time being in charge thereof, and the person causing, directing, or permitting the landing or movement, and the person landing or moving or conveying the pig, and the consignee or other person receiving or keeping it knowing it to have been landed or moved in contravention as aforesaid, and the occupier of the place from which the pig is so moved, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

(2.) If a person in charge of a pig being landed or moved, where under this Order a licence is necessary, on demand made under this Order, fails to give his true name and address, or gives a false name or address, he shall be deemed guilty of an offence against the Act of 1894.

(3.) If any person fails to deliver up or send a licence, as required by this Order, he shall be deemed guilty of an offence against the Act of 1894.

(4.) If a pig is not marked as required by this Order, the owner, consignee, or other person for the time being in charge thereof, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

(5.) If any person, with a view unlawfully to evade or defeat the operation of this Order, by washing, or in any other manner, takes out, effaces, or obliterates, or attempts to take out, efface, or obliterate, any mark painted on any pig as required by this Order, the person doing the same, and the person causing, directing, or permitting the same to be done, and the owner of the pig, and the person for the time being in charge thereof, shall, each according to and in respect of his own acts and defaults, be deemed guilty of an offence against the Act of 1894.

Interpretation.

8. In this Order, unless the context otherwise requires—

- ‘Bacon-factory’ means premises in which the business of a curer of bacon is carried on :
- ‘Slaughterhouse’ means any premises where animals are habitually slaughtered :
- ‘Person’ includes any body of persons corporate or unincorporate :
- ‘Inspector’ includes Veterinary Inspector :
- ‘The Board’ means the Board of Agriculture and Fisheries :
- ‘The Act of 1894’ means the Diseases of Animals Act, 1894.

Commencement.

9. This Order shall come into operation on the first day of February nineteen hundred and nine.

Short Title.

10. This Order may be cited as the Swine Fever (Movement from Isle of Man) Order of 1909.

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